



**B & A**  
**ARITHMETIC**  
W. R. GATEHOUSE  
BOOK 4  
CASSELL AND COMPANY

**FOSTER'S SCHOOL,  
WELLING, KENT.**

**57 SEP 1962**

# “B” SUMS

*to begin with*

## INTRODUCTION

THESE books are written by a practising teacher. They give plenty of sums, carefully planned to suit slow and fast pupils.

The sums are well graded, with the object of taking pupils step by step through all the difficulties of each rule. This will be found to facilitate working the class in sections, a procedure which is almost always desirable but never easy, especially when classes are large.

Slow pupils will work at the first or “B” part of the book until the rule is thoroughly mastered. *Faster pupils, guided by the footnotes, will “go through the door” to the “A” part of the book which contains tests and harder sums in the same rule.* In this way the teacher can easily arrange for each section to work at its appropriate level, and further instruction can be given to a group of pupils while the rest are working with their books.

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*As the Author is engaged under the London County Council, it is necessary to state that the Council is in no way responsible for anything which is contained in this book.*

A

- |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. 16s. $4\frac{1}{2}$ d. + £27 1s. 3d. +<br>£18 0s. $0\frac{1}{4}$ d. + £1000<br>2. £36 14s. $9\frac{1}{4}$ d. $\times$ 89<br>3. £900 $\div$ 37<br>4. 9647 halfpence to £ s. d.<br>5. £600 - 14s. $6\frac{1}{4}$ d.<br>6. Reduce 1000 half-crowns to<br>£ s. d. | 7. Reduce £20 4s. $6\frac{1}{2}$ d. to half-<br>pence.<br>8. £29 + 3s. $8\frac{1}{4}$ d. + £6 4s. 10d. +<br>£900<br>9. Reduce £26 15s. 0d. to half-<br>crowns.<br>10. £64 12s. $0\frac{1}{2}$ d. $\times$ 37<br>11. £920 16s. $4\frac{1}{4}$ d. $\div$ 42<br>12. £26 14s. $6\frac{3}{4}$ d. - 19s. $11\frac{1}{2}$ d. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

B

- |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. £62 14s. $8\frac{1}{2}$ d. + £17 6s. 2d. +<br>9d. + 14s. $8\frac{3}{4}$ d.<br>2. £1000 - 9s. $11\frac{1}{4}$ d.<br>3. £23 17s. $8\frac{1}{2}$ d. $\times$ 37<br>4. £600 $\div$ 29<br>5. Reduce 2943 threepences to<br>£ s. d.<br>6. Reduce £126 8s. 8d. to four-<br>pences. | 7. 14 gn. - $1\frac{1}{2}$ gn.<br>8. $3\frac{1}{2}$ gn. + $\frac{1}{4}$ gn. + £2 10s. -<br>£3 6s. 8d.<br>9. Reduce $4\frac{1}{2}$ gn. to twopences.<br>10. From £3 $\frac{5}{8}$ take 14s. $6\frac{1}{2}$ d.<br>11. Bring $\frac{1}{4}$ million half-crowns to<br>£ s. d.<br>12. £43 6s. $7\frac{1}{2}$ d. $\times$ 47. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

C

- |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                             |
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| 1. £12 7s. $0\frac{1}{4}$ d. + £3 18s. $2\frac{1}{2}$ d. +<br>10s. + £3 0s. $11\frac{1}{4}$ d.<br>2. £600 1s. $1\frac{1}{2}$ d. - £5 11s. 9d.<br>3. £49 2s. $7\frac{1}{2}$ d. $\div$ 13<br>4. £19 12s. $5\frac{3}{4}$ d. $\times$ 37<br>5. Reduce £1 10s. 6d. to two-<br>pences.<br>6. 17 half-crowns + 201d. | 7. £5 - 17 $\frac{1}{4}$ florins.<br>8. £12 9s. $6\frac{1}{4}$ d. + £2 12s. 0d. +<br>£13 5s. $7\frac{1}{2}$ d. + £22 6s. 1d.<br>9. £100 - £9 16s. $2\frac{1}{4}$ d.<br>10. £390 5s. 10d. $\div$ 19<br>11. Multiply £12 17s. 8d. by 31<br>12. ( $\frac{1}{3}$ of £2) + ( $\frac{7}{8}$ of 10s.) + ( $\frac{2}{3}$ of<br>£3). |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

D

- |                                                                                                                                                                                                         |                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. 17s. 6d. $\div$ $10\frac{1}{2}$ d.<br>2. £1 3s. 11d. $\div$ 5s. $11\frac{3}{4}$ d.<br>3. £286 $\div$ 5s. 6d.<br>4. £5 6s. 8d. $\div$ 1s. 4d.<br>5. £1 15s. $\div$ 2s. 11d.<br>6. 18s. 9d. $\div$ 9d. | 7. £28 17s. 6d. $\div$ 1s. 3d.<br>8. £29 6s. $0\frac{1}{2}$ d. $\div$ £1 0s. $2\frac{1}{2}$ d.<br>9. £1 5s. 6d. $\div$ 1s. 6d.<br>10. £8 10s. $\div$ 1s. 5d.<br>11. £4 15s. $\div$ 4s. 9d.<br>12. £58 5s. 6d. $\div$ 10s. 6d. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*A*

1. Find the weight which cost 9s. 7½d. if the price was 1s. 9d. per lb.
2. Find the total cost of 2½ cwt. of metal at £2 3s. 6d. per cwt. plus a total charge of 4s. 6d. for cartage.
3. If 2 ton 17 cwt. cost £6 17s. 9d., find the cost of 1 cwt.
4. Make out a bill for: 1 stone of potatoes at 1½d. per lb., 5½ lb. of spring greens at 3d. per lb., and 4 oz. of dates at 2s. 6d. per lb.
5. Multiply thirty-seven pounds and sixpence farthing by eighty-four.
6.  $£3\frac{5}{8} + £1\frac{1}{8} + £2\frac{2}{3} - £4\frac{1}{8}$ .
7.  $£6.5 + £3.75 + £5.875 + £.3$ .
8. Find the difference between £9.9 and 73 half-crowns.
9. From 1000 fourpences take 1000 three-halfpences.
10. Find the cost of 16 yd. 2 ft. 3 in. at 3s. 4d. per yard.
11. An article was marked at 16 guineas. The shopkeeper was unable to sell it, so he reduced the price by  $\frac{1}{8}$ . What is the price now?

*B*

1. A greengrocer sold potatoes so that he received 14s. for each hundredweight. A woman bought 7 lb. of potatoes. What did she pay for them?
2. A boy worked 48 hours per week, and was paid 10½d. per hour. How much did he earn in 52 weeks?
3. A dealer bought a load of metal for £5 10s. In addition, he paid 6s. 9d. for carriage. If he sold the metal for £8 5s., what profit did he make?
4. A man's rent is 18s. per week and his rates are £3 5s. 6d. per quarter. What are his total payments for 1 year (52 weeks)?
5. There are 325 boys in a school. 280 of them pay 1d. each, the others pay 2d. each. How much is paid in all?
6. A new path cost £8961 to make. Find the length of the path in feet if each foot cost 30s.



## A

1. 13 hr. 14 min. 30 sec. + 37 min. 18 sec. + 2 hr. 11 min. 15 sec.
2.  $2\frac{3}{4}$  ton + 15 cwt. 1 qr. +  $\frac{1}{2}$  cwt. + 3 ton 16 cwt.
3. 3 gall. 1 qt. 1 pt. +  $8\frac{3}{4}$  gall. +  $3\frac{1}{2}$  qt. + 4 gall. 1 qt.
4. 1 mile 6 fur. 8 chn. +  $4\frac{1}{2}$  ml. +  $6\frac{1}{2}$  fur.
5.  $12\frac{1}{2}$  min. + 1 day 6 hr. +  $5\frac{3}{4}$  hr. +  $\frac{1}{2}$  hr.
6. 1 st. 3 lb. 8 oz. +  $3\frac{1}{2}$  st. +  $14\frac{1}{2}$  lb.
7. 8 bush. 3 pecks 1 gall. +  $3\frac{1}{2}$  bush. +  $2\frac{1}{2}$  pecks.
8. 22 yd. 1 ft. 8 in. +  $3\frac{1}{2}$  ft. +  $2\frac{1}{2}$  yd. + 13 yd.
9.  $1\frac{1}{2}$  ton + 1 qr. 1 st. +  $3\frac{1}{2}$  qr. + 4 cwt. 1 qr.
10. 9 ch. 3 yd. 1 ft. +  $4\frac{1}{3}$  yd. + 4 ch. 1 yd.

## B

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. 23 hr. 13 min. — 2 min. 33 sec.</li> <li>2. 1 mile 6 fur. — 4 fur. 8 chn.</li> <li>3. <math>4\frac{1}{2}</math> gall. — 3 qt. 1 pt.</li> <li>4. 1 ton 16 cwt. — 3 cwt. 1 qr.</li> <li>5. <math>8\frac{1}{3}</math> yd. — <math>2\frac{1}{2}</math> ft.</li> <li>6. 1 st. 13 lb. 6 oz. — <math>8\frac{3}{4}</math> lb.</li> <li>7. <math>8\frac{1}{2}</math> bush. — <math>3\frac{1}{2}</math> pecks.</li> <li>8. 1 yr. 36 wk. — 22 wk. 4 dy.</li> <li>9. <math>12\frac{1}{2}</math> hr. — 33 min. 32 sec.</li> <li>10. 9 ch. 3 yd. — 1 yd. 15 in.</li> </ol> | <p style="text-align: center;"><i>5 hr 5 mins 1 sec</i><br/>Reduce</p> <ol style="list-style-type: none"> <li>1. 2469 in. to chains, etc.</li> <li>2. 4674 oz. to stones, etc.</li> <li>3. 4326 pt. to gallons, etc.</li> <li>4. 3684 hr. to weeks, etc.</li> <li>5. 4684 yd. to miles, etc.</li> <li>6. 4 gall. 3 qt. 1 pt. to pints.</li> <li>7. 1 ml. 6 fur. 8 ch. to chains.</li> <li>8. 16 hr. 14 sec. to seconds.</li> <li>9. 2 cwt. 1 st. 13 lb. to pounds.</li> <li>10. 13 yd. 8 in. to inches.</li> </ol> |
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## D

1. 13 ml. 4 fur. 6 ch.  $\times 28$
2. 14 gall. 3 qt. 1 pt.  $\times 37$
3. 23 hr. 14 min. 13 sec.  $\times 46$
4. 3 ton 14 cwt. 1 qr.  $\times 65$
5. 27 yd. 19 in.  $\times 84$
6. 13 dy.  $6\frac{1}{2}$  min.  $\times 29$
7. 14 qr. 7 bush. 3 pk.  $\times 34$
8. 3 st. 6 oz.  $\times 73$
9. 3 fur. 15 yd.  $\times 67$
10.  $16\frac{3}{4}$  ton  $\times 56$

## E

1. 12 ml. 3 fur. 5 ch.  $\div 34$
2. 133 hr. 13 min. 14 sec.  $\div 43$
3. 133 gall. 1 qt. 1 pt.  $\div 56$
4. 13 st. 13 lb. 6 oz.  $\div 39$
5. 22 yd. 1 ft. 7 in.  $\div 40$
6. 14 wk. 3 dy. 15 hr.  $\div 50$
7. 17 bush. 3 pk. 1 gall.  $\div 48$
8. 14 ton 16 cwt. 1 qr.  $\div 53$
9. 13 ch. 14 yd. 25 in.  $\div 45$
10. 4 yr. 13 wk. 4 dy.  $\div 35$

## A

1. A merchant has two cases of tea. The first holds  $1\frac{3}{4}$  cwt., the second  $1\frac{1}{2}$  cwt. How many more 4-oz. packets can he make from the first than from the second?
2. Find the value of 2 yd. 2 ft. 6 in. of cord at 3d. per foot.
3. By how much is 18.75 ton greater than 11 ton 9 cwt.?
4. A grocer bought 4 chests of tea at £10 5s. 9d. each. He made the tea up into 27 one-pound packets, 65 half-pound packets and 330 quarter-pound packets. He sold the tea at 6s. per pound. Find his profit.
5. A dairyman bought 16 churns of milk, each holding 6 gall. 3 qt. 1 pt., at 4s. per gallon. If he was able to sell all the milk at 5s. 0d. per gallon, what profit did he make?
6. What length of fencing will be required for both sides of a road .75 mile long? Give your answer in chains.
7. After selling 15 packets of chocolate, each weighing 12 oz., a confectioner had 7 lb. left. What weight had he at first?

## B

1. The length of my step is 32 in. How many yards can I walk in 15 min. if I take 2 steps per second?
2. If a case-maker takes 10 minutes to make a box, how many will he make between 12.30 p.m. and 6.20 p.m.?
3. A cook had 2 lb. of sugar. She makes 7 cakes, using  $3\frac{1}{2}$  oz. of sugar for each cake. How much sugar has she left?
4. A man carrying a pack weighs 14 stone 2 lb. 8 oz. The pack weighs  $21\frac{1}{2}$  lb. What is the man's weight?
5. An empty box weighed  $5\frac{1}{2}$  lb. 144 bags of soda were put in it and now the whole weight is  $77\frac{1}{2}$  lb. Find the weight of each bag of soda.
6. A woman takes £1 worth of wool to knit a jumper. An ounce of wool consists of 176 yd. and costs 2s. What length of wool is in the jumper?
7. By how many inches is  $\frac{5}{8}$  mile more than 1 kilometre?  
1 kilometre=1000 metres and 1 metre=39.37 inches.

## FRACTIONS

## A

- I.  $1\frac{1}{3} + 3\frac{1}{4} + \frac{5}{6}$
2.  $1\frac{7}{11} + 2\frac{1}{2} + \frac{1}{4}$
3.  $4\frac{1}{5} + 2\frac{1}{25} + \frac{3}{10}$
4.  $2\frac{2}{3} + 1\frac{1}{4} + 3\frac{5}{12}$
5.  $5\frac{1}{8} + \frac{4}{5} + 1\frac{1}{6}$
6.  $3\frac{3}{7} + 1\frac{1}{6} + 2\frac{1}{2}$
7.  $12\frac{2}{11} + 6\frac{1}{3} + 1\frac{1}{2}$
8.  $6\frac{4}{5} + 2\frac{5}{8} + 3\frac{3}{4}$
9.  $16 + 7\frac{1}{3} + 8\frac{5}{18}$

10.  $13\frac{1}{27} + 2 + 4\frac{2}{3}$
11.  $9\frac{2}{3} - 3\frac{1}{4}$
12.  $7\frac{3}{4} - 2\frac{1}{3}$
13.  $5\frac{1}{5} - 3\frac{1}{2}$
14.  $3\frac{1}{6} - 2\frac{5}{12}$
15.  $14\frac{1}{2} - 7\frac{1}{10}$
16.  $13 - 2\frac{3}{8}$
17.  $16 - 3\frac{1}{6}$
18.  $13\frac{2}{7} - 2\frac{1}{4}$

19.  $9\frac{1}{10} - 2\frac{1}{2}$
20.  $20 - 1\frac{5}{7}$
21.  $2\frac{3}{4} + 1\frac{1}{3} - 1\frac{1}{2}$
22.  $1\frac{1}{11} - 2\frac{1}{4} + 3\frac{5}{6}$  *in 1/6*
23.  $3\frac{4}{5} + 2\frac{1}{10} - \frac{1}{5}$
24.  $4\frac{5}{6} + 3\frac{5}{8} - 3\frac{5}{12}$
25.  $5\frac{3}{4} - 2\frac{1}{2} + 6\frac{5}{6}$
26.  ~~$7\frac{5}{8} - 9\frac{5}{6} + 6\frac{7}{12}$~~
27.  $3\frac{5}{11} - 1\frac{1}{2} + 2\frac{2}{3}$

## B

- I.  $5\frac{5}{8} \times 2\frac{2}{5} \times 2\frac{8}{9}$
2.  $3\frac{1}{3} \times 8\frac{4}{5} \times 2\frac{2}{11}$
3.  $3\frac{1}{4} \times 12 \times \frac{2}{13}$
4.  $1\frac{1}{2} \times \frac{8}{21} \times \frac{7}{9}$
5.  $1\frac{7}{8} \times 1\frac{1}{3} \times 6\frac{2}{3}$
6.  $1\frac{9}{16} \times \frac{7}{10} \times 13$
7.  $\frac{5}{12} \times 4 \times 3$
8.  $1\frac{1}{5} \times 25 \times \frac{1}{6}$
9.  $2\frac{2}{5} \times 2\frac{11}{12} \times 1\frac{5}{13}$

10.  $3\frac{3}{5} \times 7\frac{1}{7} \times 3\frac{1}{9}$
11.  $3\frac{3}{7} \div 3\frac{3}{5}$
12.  $5\frac{5}{6} \div 5\frac{2}{3}$
13.  $6\frac{6}{7} \div 4\frac{4}{5}$
14.  $2\frac{1}{3} \div 7$
15.  $5\frac{1}{7} \div 4\frac{4}{5}$
16.  $12\frac{2}{3} \div 2\frac{8}{15}$
17.  $2\frac{1}{4} \div 9$
18.  $5\frac{1}{7} \div 9\frac{2}{7}$

19.  $8\frac{2}{3} \div 3\frac{1}{4}$
20.  $3\frac{2}{3} \div 11$
21.  $(6\frac{7}{8} \div 3\frac{1}{3}) \times 2\frac{2}{3}$
22.  $(7\frac{7}{9} \div 4\frac{1}{5}) \times 2\frac{7}{10}$
23.  $(5\frac{5}{7} \div 8\frac{1}{3}) \times 3\frac{3}{4}$
24.  $(3\frac{2}{3} \div 3\frac{1}{3}) \times 3\frac{1}{3}$
25.  $8\frac{1}{3} \times 2\frac{2}{5} \div 4\frac{1}{3}$
26.  $(2\frac{1}{4} \div 9) \times \frac{8}{11}$
27.  $(7\frac{1}{7} \div 1\frac{1}{4}) \times 1\frac{3}{4}$

## C

- I.  $3\frac{1}{3} \div (1\frac{1}{2} + \frac{1}{10})$  *10*
2.  $(3\frac{5}{6} + 2\frac{1}{2}) \div (3\frac{5}{6} - 2\frac{1}{2})$
3.  $3\frac{2}{3} \div (\frac{2}{3} \text{ of } 3\frac{3}{4})$
4.  $\frac{1\frac{4}{5}}{2\frac{2}{3} + 1\frac{5}{6}}$
5.  $\frac{2\frac{2}{3} \text{ of } 2\frac{1}{4}}{\frac{5}{6}}$
6.  $\frac{\frac{5}{6} \times \frac{3}{10} \times \frac{9}{16}}{\frac{5}{8}}$

7.  $(3\frac{1}{3} - 1\frac{1}{3}) + (2\frac{1}{10} + 2\frac{1}{2})$
8.  $\frac{2\frac{3}{4} + 1\frac{1}{5}}{5\frac{1}{5}}$
9.  $\frac{2\frac{2}{3} + 4\frac{1}{12}}{1\frac{1}{9}}$
10.  $(3\frac{2}{3} - \frac{1}{6}) - (\frac{5}{12} + 1\frac{1}{2})$
11.  $\frac{7}{8} \times (1\frac{1}{7} + \frac{1}{2})$
12.  $(\frac{3}{5} \text{ of } \frac{20}{1}) + (1\frac{1}{3} \times \frac{7}{8})$

## A

1. What fraction of a cake is left after  $\frac{1}{2}$  and  $\frac{1}{3}$  have been eaten?
2. Three pieces of wood,  $10\frac{1}{2}$  in. long,  $3\frac{2}{3}$  in. long and  $7\frac{7}{10}$  in. long respectively, are placed end to end. Find their total length.
3. What must be added to  $2\frac{1}{16}$  to make  $3\frac{1}{2}$ ?
4. A woman has  $5\frac{1}{2}$  oz. of sugar. She uses  $3\frac{2}{3}$  oz. How many ounces left?
5. Find the product of  $2\frac{1}{2}$  and  $2\frac{1}{4}$ , and take  $3\frac{1}{6}$  from the answer.
6. A car travels  $\frac{5}{8}$  of a mile in 1 minute. How far will it go in  $12\frac{2}{3}$  minutes?
7. How many times can I take  $1\frac{1}{6}$  from  $38\frac{1}{2}$ ?
8.  $\pounds 1\frac{1}{5} + \pounds 1\frac{1}{3} + \pounds 1\frac{1}{4} + \pounds 1\frac{1}{8}$ .
9. Find the difference between  $\frac{2}{3}$  of 690 and  $\frac{1}{6}$  of 690.
10. Billy had 324 marbles. He sold five-sixths of them. How many had he left?

## B

1. If I use  $2\frac{1}{2}$  tons of coal in 35 weeks, how many hundredweights do I use per week?
2. Forty leaves of a book occupy  $5\frac{1}{2}$  millimetres. How thick is each leaf?
3. A sheet of paper  $48\frac{7}{8}$  square inches in area is cut into 6 equal pieces. Find the area of each piece.
4. A man starts on some work at 9 a.m., and by 12 noon he has done  $\frac{2}{5}$  of it. If he continues to work at the same rate, when will he finish?
5. Twelve girls share equally 8 slabs of chocolate, each of which weighs 8 ounces. What fraction of a pound does each girl get?
6. A man earning  $\pounds 8$  per week pays 20s. for rent and 50s. for food. What fraction of his money is left?
7. An oil stove consumes  $\frac{3}{4}$  gallon of oil in 8 hours. What fraction of a pint is this per hour?
8. A woman who makes tea 3 times a day uses each time  $\frac{3}{4}$  oz. How much tea will she use during January?
9. A typist who does 30 words per min. has to do 8100 words in all. What fraction of her task will she do between 10 a.m. and 1 p.m.?
10. From the product of  $1\frac{1}{4}$  and  $1\frac{1}{3}$ , take  $1\frac{1}{4}$ .

## A

- I.  $26.4 + 3.26 + .76$
2.  $13.6 + 25.8 + 12.7$
3.  $16.81 + 25.79 + 14.32$
4.  $2.847 + 3.68 + 12.4$
5.  $16 + .26 + .003 + 1.6$
6.  $2.008 + 6.732 + 4.62$
7.  $3.04 + 2.627 + 3.724$
8.  $13.62 + 7.329 + .004$

9.  $23 + .1 + .006 + .0006$
- IO.  $7.2 + .1 + .01 + .001$
- II.  $25.3 + 1.81 + 102.681 + 9.44$
- I2.  $3.01 + 15 + 6.001 + .092$
- I3.  $113 + .0053 + 2.7 + 15.009$
- I4.  $51.7 + 3.091 + 201 + 5.32$
- I5.  $19 + .006 + 7.3 + 196$
- I6.  $100 + 10 + .01 + .001$

## B

- I.  $8.71 - 3.52$
2.  $19.95 - 7.56$
3.  $.036 - .002$
4.  $31.4 - 15.9$
5.  $24.647 - 6.232$
6.  $19.6 - 2.04$
7.  $12 - .007$
8.  $16 - .04$
9.  $13.62 - 5.9$
- IO.  $1 - .003$
- II.  $100 - 1.897$
- I2.  $196 - .9$

## C

- I.  $3.9 \times 4.6$
2.  $5.09 \times 19$
3.  $2.36 \times 2.4$
4.  $3.06 \times 7.3$
5.  $25.73 \times 28$
6.  $24 \times 6.8$
7.  $12.74 \times 1.05$
8.  $16.004 \times 2.5$
9.  $12.45 \times .38$
- IO.  $1.006 \times 1.04$
- II.  $9.375 \times 6.4$
- I2.  $.002 \times .036$

## D

- I.  $12.7 \div 8$
2.  $16.426 \div 28$
3.  $24.62 \div 2.5$
4.  $8.414 \div 60$
5.  $.136 \div .35$
6.  $12.1 \div 55$
7.  $96.35 \div 40$
8.  $133.032 \div 18.4$
9.  $3.7 \div 20$
- IO.  $45 \div 24$
- II.  $36 \div .34$
- I2.  $10 \div .064$

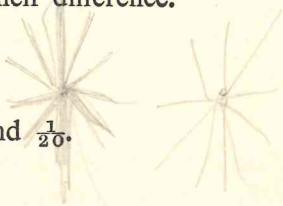
## E

- I.  $16 + .04 - 3 - .006 + \frac{3}{4}$
2.  $13.61 + 4.5 + .9 - 16 - \frac{1}{2}$
3.  $(12.6 \times .04) - .3$
4.  $(14.91 - 3.8) \times 9$
5.  $17.364 + 2.96 - .08$
6.  $(2.5 \times 4) + (3.6 \times 5)$
7.  $(3.6 \times 6) - (7.1 \times 2)$
8.  $(46.5 \div 5) - 9.3$

9.  $(24.6 \times 2.5) \div .24$
- IO.  $(3.6 \div 4) + (.56 \div 8)$
- II.  $(26.4 - 3.8) \div 2.5$
- I2.  $\frac{.2 - .06 + 16}{.25}$
- I3.  $(4.1 - 3.05) \div (14.6 - 13.55)$
- I4.  $\frac{1.6 - .4 + .8}{2.5}$

## A

1. After spending  $\cdot 1$  and  $\cdot 6$  of my money, what decimal fraction is left?
2. How often can I subtract  $2\cdot 4$  from  $36$ ?
3. A man spent  $\cdot 3$  and  $\cdot 2$  of his money. What had he left out of 5 guineas?
4. Find the difference between  $\cdot 006$  and  $\cdot 6$ .
5. Find the sum of  $\pounds 25$ ,  $\pounds 5$ ,  $\pounds 1$ ,  $\pounds 875$ .
6. What must be added to  $\cdot 004$  to make unity?
7. From the sum of  $2\cdot 67$  and  $3\cdot 04$  take their difference.
8. What must be added to  $\frac{1}{8}$  to make  $\cdot 8$ ?
9. How much short is  $\cdot 05$  of  $\frac{3}{20}$ ?
10. Add in decimals  $24\frac{1}{2}$ ,  $17\frac{3}{4}$ ,  $8\frac{2}{5}$ ,  $16\frac{3}{8}$  and  $\frac{1}{20}$ .



## B

1. A dressmaker had  $8\cdot 75$  metres of silk. She used  $4\cdot 88$  metres. How much was left?
2. What number multiplied by  $3\cdot 14$  comes to  $39\cdot 25$ ?
3. A car ran for  $\cdot 85$  of an hour at the rate of  $24\cdot 95$  miles per hour. How far did it go?
4. A sheet of paper  $48\cdot 2$  sq. in. in area is divided into 5 equal parts. Find the area of each part.
5. On a page are 22 lines  $\cdot 4$  inches apart. How far is it from the top line to the bottom?
6. Find the perimeter of a rectangle  $3\cdot 15$  in. wide and  $8\cdot 3$  in. long.
7. If a litre equals  $1\cdot 75$  pt. find the value in litres of 10 gall. 2 qt.
8. Take  $\cdot 001 + \cdot 36 - \cdot 07$  from unity.
9. A lead pencil is  $4\cdot 175$  in. long. Each time it is sharpened  $\cdot 025$  of an inch is taken off. What length will it be after it has been sharpened 15 times?

| <i>A</i>                                          | <i>B</i>                                                              |
|---------------------------------------------------|-----------------------------------------------------------------------|
| 1. $26\cdot4 \times 100$ =                        | 1. What fraction is 1s. 8d. of £1?                                    |
| 2. $1\frac{3}{4}$ lb. at 1s. 4d. per lb. =        | 2. If 15 cards cost 16s. find the cost of 60.                         |
| 3. $1\frac{1}{4} + 2\frac{3}{8} + 1\frac{1}{2}$ = | 3. If 1s. will buy 3 lemons, how many can I buy with 1s. 8d.?         |
| 4. $\cdot 2 \times \cdot 2$ =                     | 4. 24 articles at 4 for 2d.                                           |
| 5. $\cdot 875$ of 2 shillings =                   | 5. If 6 yd. cost 3s. 6d. find the cost of 7 yd.                       |
| 6. $3\cdot 25 \times 12$ =                        | 6. If 4 men take 3 days over a job how long will 2 men take?          |
| 7. 3 oz. at 2s. per lb. =                         | 7. If a man saves £9 in six weeks, in how many weeks will he save £6? |
| 8. $2\frac{1}{2} \times 2\frac{1}{2}$ =           | 8. How many pears, each 1·50 francs, can I buy with 30 francs?        |
| 9. $3\frac{1}{2}$ d. $\times 240$ =               |                                                                       |
| 10. $5\cdot 5 - 3\cdot 8$ =                       |                                                                       |

## PROPORTION

*A*

1. Find the cost of 16 books when 12 cost 9s.
2. What will 48 packages cost when 36 cost £12?
3. If 38 cases weigh 75 lb., what will 57 weigh?
4. If 25 cows eat 35 bushels per day, for how many cows would 49 bushels provide?
5. If 68 pigs cost £850, what would 23 cost?
6. If 12 Swiss francs are worth 20s., find the value of 11 Swiss francs.
7. A man can climb 300 feet in 20 min. How long will he take to climb 1950 feet?

*B*

1. A car travels 90 miles in 4 hours. How far will it travel in 5 hours?
2. I walk 5 miles in  $1\frac{1}{4}$  hr. How far can I walk in 2 hr.?
3. A train went 200 miles in  $6\frac{1}{4}$  hr. How long would it take to go 72 miles at the same rate?
4. A boy earns £19 in 4 weeks. In how many weeks would he earn £61 15s. 0d.?
5. A farmer had enough fodder to last 8 cows 14 weeks. If he sold 1 cow how long would the fodder last?
6. A train, travelling 40 miles per hour, did a journey in 33 mins. How long would the journey take if the train went 30 miles per hour?
7. If 15 books cost £3, find the price of a dozen books.

*A*

1. 6 lb. cost 7 shillings. Find the value of 3 stones.
2. In 7 days a woman pays 3s. 0 $\frac{3}{4}$ d. for milk. What is her milk bill for the month of March?
3. A boy worked 40 hr. for £2 10s. 0d. How long would he work for 2 guineas?
4. If I buy 3 tons for £8 15s., what ought I to pay for 15 cwt.?
5. On goods worth £3 10s. an importer pays 21s. duty. What was the value of goods on which the duty came to £1 19s. 0d.?
6. A motor car ran 204 miles on 7 $\frac{1}{2}$  gall. of petrol. How far should it travel on 41 $\frac{1}{4}$  gall.?
7. 28 cows have fodder for 15 days. How long will it last 21 cows?
8. 24 men can build a house in 35 days. How long should it take 36 men?
9. A house with a frontage of 29 ft. pays £43 10s. towards the making of the road. How much should be paid by a house with a frontage of 36 ft.?

*B*

1. If 12·5 lb. of tea cost £3 15s. 0d., what weight should £6 12s. 0d. buy?
2.  $\frac{5}{9}$  of a certain sum of money is £8 12s. 6d. Find the whole of it.
3. 28 campers have food to last them for 42 days. If 21 more people join them, how long will the rations last?
4. What would be the value of a roll of cloth 36 in. wide and 15 ft. long if 12 sq. yd. cost 27s.?
5. A farmer received £1 for 12 gall. of milk. What should he receive for 14 gall.?
6. To carry 5 ton of goods 20 miles a charge of 16s. 8d. is made. How many miles could I send 5 ton for 12s. 6d.?
7.  $\frac{1}{3}$  of a box contains 4 $\frac{1}{2}$  dozen oranges. How many will  $\frac{1}{2}$  a box hold?
8. If  $\frac{1}{2}$  cwt. costs 11s. 8d., how much ought I to receive for 1s. 5 $\frac{1}{2}$ d.?
9. A material 6 sq. yd. 4 sq. ft. in area is priced at £3 15s. 0d. Find the cost of the same material 9 sq. yd. 6 sq. ft. in area.

## A

1. If  $\frac{6}{11}$  of a certain load weighs 42 lb., find the weight of  $\frac{8}{11}$  of the load.
2. A boy read  $\frac{3}{8}$  of a book in 20 hr. How long would it take him to read the rest of the book?
3. If 10 francs are worth 1s. 8d., what is the value of 2005 francs?
4. A boy's stride is 18 inches, and he takes 35 steps to cross a courtyard. How many steps will he take if he extends his stride to 21 inches?
5. 1.25 gallons of liquid weigh 12.5 lb. What volume of liquid will weigh 7.5 lb.?
6. A dressmaker has two equal rolls of cloth. The first roll she cuts into 168 pieces, each 2 ft. 4 in. long. The second roll she cuts into pieces each 2 ft. long. Find the total number of pieces.
7. On a map  $\frac{3}{4}$  in. represents 15 miles. How many miles will be represented by 13.5 inches?

## B

1. What will 80 gross of books cost at £1 8s. 11d. per doz.?
2. In making a chest a man uses wood worth £1 1s. 4d. This wood was worth 2d. per square foot. If he had used wood worth  $2\frac{1}{2}$ d. per square foot, how much more would it have cost?
3. For every 6d. Tom saves, Jack saves 9d. Find their total savings when Jack has saved 12s. 9d.
4. A boy has two equal sheets of paper. He cuts the first into 24 strips, each .35 in. wide. Into how many strips each .2 in. wide can he cut the second?
5. On a map, scale 20 miles to 1 inch, a river is 4.85 in. long. How long will it be on a second map, scale 25 miles to 1 inch?
6. Along a road is a line of trees, planted at regular intervals. A boy runs from the third tree to the nineteenth in 48 seconds. How long will he take to run from the fifth to the twenty-third?
7. When a shopkeeper takes £35, he makes a profit of £2 15s. 0d. How much must he take to make a profit of £3 6s. 0d.?

| <i>A</i>                                   |   | <i>B</i>                                                                  |  |
|--------------------------------------------|---|---------------------------------------------------------------------------|--|
| 1. $241 \times \frac{3}{4}$ d.             | = | 1. Width= $2\frac{1}{2}$ ft. Length=5 ft. Find area.                      |  |
| 2. $\cdot 375$ of 4 gall.                  | = | 2. What fraction of 8 sq. yd. is 3 sq. yd. 5 sq. ft.?                     |  |
| 3. $\cdot 15 \times \cdot 12$              | = | 3. Width= $10\frac{1}{2}$ yd. Length= $13\frac{3}{4}$ yd. Find perimeter. |  |
| 4. $9 \times \frac{1}{3} \times 0$         | = | 4. Area=15 sq. in. Length=9 in. Find width.                               |  |
| 5. $2 \div \frac{3}{8}$                    | = | 5. 3 lb. 5 oz. at 2s. per lb.                                             |  |
| 6. $\cdot 875$ of 2s.                      | = | 6. 2 gall. at $1\frac{1}{2}$ d. per pint.                                 |  |
| 7. $29 \cdot 6 \times 1000$                | = | 7. Write down one and a half million in figures.                          |  |
| 8. $\frac{3}{4}$ of 172                    | = |                                                                           |  |
| 9. $\cdot 2 \times \cdot 3 \times \cdot 2$ | = |                                                                           |  |
| 10. $12 \div \cdot 3$                      | = |                                                                           |  |

AREA

1. Find the areas of the following rectangles:—

| Length.                | Width.             | Length.                | Width.             |
|------------------------|--------------------|------------------------|--------------------|
| (a) 7 in.              | $3\frac{1}{2}$ in. | (b) 1 in.              | $\frac{1}{5}$ in.  |
| (c) 11 in.             | $8\frac{3}{4}$ in. | (d) $5\frac{1}{4}$ in. | $3\frac{2}{3}$ in. |
| (e) $8\frac{3}{4}$ ft. | $4\frac{3}{4}$ ft. | (f) 6 ft.              | 8 in.              |
| (g) 5 yd.              | 9 in.              | (h) 2 ft. 8 in.        | 1 ft. 6 in.        |
| (i) $3\frac{1}{2}$ yd. | $2\frac{2}{3}$ ft. | (j) 2 yd. 2 ft. 3 in.  | 1 yd. 1 ft.        |

2. Find the areas of the following squares. (The measurement given is the length of the side.)

- (a)  $\frac{3}{4}$  in. (b)  $\frac{1}{2}$  in. (c)  $1\frac{1}{8}$  ft. (d)  $2\frac{1}{8}$  yd. (e) 1 yd. 1 ft.  
 (f) 1 yd. 0 ft. 6 in. (g)  $5\frac{1}{2}$  yd. (h) 2 yd. 1 ft.  $1\frac{1}{2}$  in.

3. Find the values of the following rectangles:—

| Length          | Width              | Price                         |
|-----------------|--------------------|-------------------------------|
| (a) 5 ft.       | $1\frac{1}{2}$ ft. | 6d. per sq. ft.               |
| (b) 8 in.       | $\frac{3}{4}$ in.  | $1\frac{1}{2}$ d. per sq. in. |
| (c) 2 ft.       | 8 in.              | 9d. per sq. ft.               |
| (d) 4 yd.       | 2 ft.              | 1s. per sq. yd.               |
| (e) 3 yd.       | 9 in.              | 10s. per sq. yd.              |
| (f) 2 yd. 1 ft. | 5 ft. 3 in.        | 3d. per sq. yd.               |

4. Find the area of a square with a perimeter of 5 in.  
 5. Find the area of a floor 4·6 long and 9·9 ft. wide.  
 6. Find the value of a carpet 15 ft. by 14 ft. at 10s. 6d. per sq. yd.  
 7. What will it cost to stain a floor 18 ft. by 15 ft. at 3s. 6d. per sq. yd.?  
 8. If land was worth 8d. per square yard, find the value of a rectangular plot measuring 6 yd. by 21 ft.

## A

1. Find the areas, in square feet, of tiles with the following measurements:—
 

|                    |                    |
|--------------------|--------------------|
| (a) 6 in. by 6 in. | (b) 8 in. by 8 in. |
| (c) 9 in. by 9 in. | (d) 6 in. by 4 in. |
2. A courtyard 18 yd. by 6 yd. has to be covered with concrete blocks, each 3 ft. by 2 ft. How many are wanted?
3. How many tiles, each 6 in. square, will cover a rectangle  $12\frac{1}{2}$  ft. by  $2\frac{1}{2}$  ft.?
4. How many squares, each with sides measuring  $\cdot 8$  in., can be cut from a sheet of paper 1 ft. 8 in. by 4 in.?
5. How many turves, each 1 yd. by 1 ft., will be required to cover a plot of land 46 yd. by 25 yd.?
6. A field is  $80\frac{3}{4}$  yd. long and  $24\frac{3}{4}$  yd. wide. Into how many allotments, each  $7\frac{1}{2}$  yd. by  $8\frac{1}{4}$  yd. can it be divided?
7. How many tiles each 3 in. by 2 in. will cover a rectangle  $2\frac{1}{4}$  yd. long and  $1\frac{2}{3}$  wide?
8. A hall 10 yd. long and 6 ft. wide is to be covered with tiles 9 in. by 8 in.
  - (a) How many tiles will be required?
  - (b) What will they cost at 4s. 6d. per doz.?
9. A 6-inch border is to be made all round the outside of a 3 ft. square. How much will it cost to make this border with tiles, each 6 in. square, costing 4d. each?

## B

*Finding Length and Breadth*

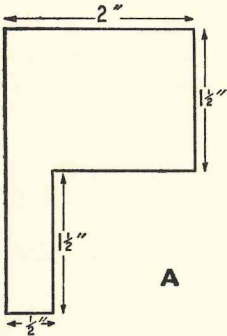
1. Area: 12 sq. ft. Length 5 ft. Find width.
2. Area:  $3\frac{1}{2}$  sq. yd. Width 1 ft. 9 in. Find length.
3. Area: 1320 sq. yd. Length  $1\frac{1}{2}$  mile. Find width.
4. Find the width of a rectangle with an area of  $36\frac{3}{4}$  sq. ft. and a length of  $10\frac{1}{2}$  ft.
5. A piece of wood, 16 in. wide, has an area of 208 sq. in. Find its length.
6. How long is a window, 3 ft. wide, if its area is 21·9 sq. ft.?
7. A room, 23·5 ft. long, has an area of 235 sq. ft. Find its width.
8. How long is a rectangular garden if its area is 240 sq. yd. and its width is 30 ft.?
9. A plate glass window 102 in. by 72 in. was broken. What length of timber 9 in. wide was required to board it up?
10. How much felting 18 in. wide will be needed to cover a corridor 12 yd. by 8 ft.?

A

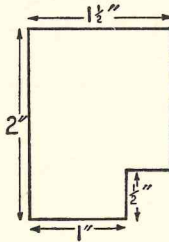
1. On a sheet of paper, 8 in. by 6 in., a boy draws a 1 in. border on all four sides. Find the total area of the border.
2. A picture, 4 in. by 7 in., is pasted on to a mount so that a 1 in. border shows on all four sides. Find the area of the border.
3. A rectangular pond, 20 yd. by 33 yd., is surrounded by a path 2 yd. wide. Find the area of the path.
4. A path  $1\frac{1}{2}$  yd. wide surrounds a rectangular field 144 yd. by 67 yd. Find the area of the path.
5. A room is 15 ft. long and 12 ft. wide. In it is a carpet 12 ft. by 9 ft. What area is not covered?
6. A lawn, 10 yd. by  $8\frac{1}{2}$  yd., is surrounded by a path 18 in. wide. Find the area of the path.
7. A carpet, 10 ft. square, is placed in a room 12 ft. 6 in. by 11 ft. What is the area of the border surrounding the carpet?
8. A grass plot measures 42 ft. by 13 ft. All round it is a border 1 yd. wide. Find the area of the border.

B

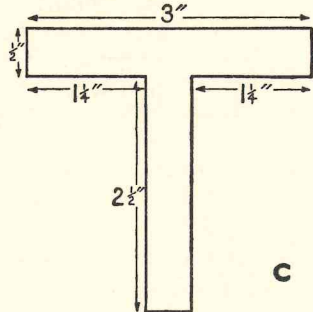
Find the areas and perimeters of the following figures.



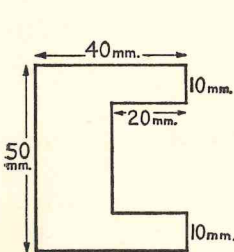
A



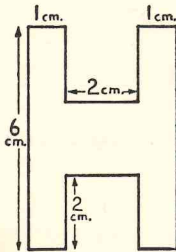
B



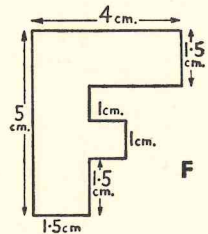
C



D



E



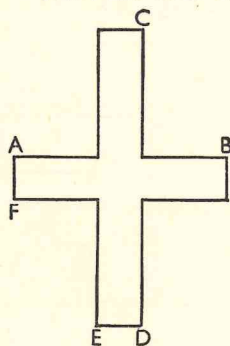
F

For more sums, see page 43.

| A                                                  | B                                                                                                |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1. 6s. 8d. $\times$ 164                            | 1. How many pieces of paper each 2 in. square can be cut from a piece measuring 6 in. by 8 in.?  |
| 2. 1 gross at 9d. each                             | 2. 1 cwt. at 7 lb. for 4d.                                                                       |
| 3. 36 lb. of paint at 3s. 9d. per lb.              | 3. If $\frac{3}{5}$ of my money is 7s. 6d. how much have I altogether?                           |
| 4. 1 cwt. at 2d. per lb.                           | 4. Find the area of a plank 10 ft. by 18 in.                                                     |
| 5. 6 yd. at $\frac{1}{2}$ d. per inch              | 5. How many square feet in a room 16 ft. 6 in. by 12 ft.?                                        |
| 6. Change £·675 to shillings.                      | 6. What length of picture rail will be required to go round a room 12 ft. 9 in. by 10 ft. 6 in.? |
| 7. 5 sq. ft. $\times$ 18                           | 7. How often can .015 be taken from .3?                                                          |
| 8. $\frac{1}{7} - \frac{1}{8}$                     |                                                                                                  |
| 9. £3 10s. $\div$ 40                               |                                                                                                  |
| 10. $7\frac{1}{2}$ gall. $\div$ $1\frac{1}{2}$ pt. |                                                                                                  |

## MENSURATION

1. A panel measures 2 ft. by  $5\frac{1}{2}$  ft. The border all round the panel is 18 in. wide. Find the perimeter of the whole.
2. The area of a field is 1500 sq. yd. Its length is 50 yd. Find the distance round the four sides of the field.
3. A room is 20 ft. square. In the middle is a carpet which leaves a 5 ft. border on all sides. Find the cost of the carpet at 15s. per sq. yd.
4. A table cloth hangs down 6 in. all round on a table which measures 4 ft. by 2 ft. 9 in. Find the area of the table cloth.
5. A room is 18 ft. long and 15 ft. wide. In the centre is a carpet 12 ft. by 10 ft. What will be the cost of staining the border at 3d. per sq. yd.?
6. On a map, scale 20 yd. to the inch, a road is  $\frac{3}{4}$  in. wide and 22 in. long. Find the cost of making the road at 30s. per sq. yd.
- 7.



Using 1-in. squares a boy made a cross as in the diagram.

$AB = 5$  in.  $CD = 7$  in.  $AF = ED = 1$  in.

How many squares did he use?

For more sums, see page 43.

A

*Areas of Boxes and Walls*

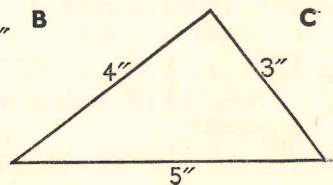
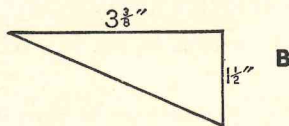
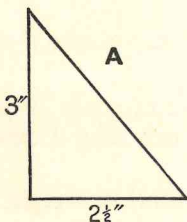
1. A room 8 ft. by 6 ft. has walls  $7\frac{1}{2}$  ft. high. Find the total area of the four walls.
2. What area of cardboard would be required to make a box, with lid, 2 ft. by 1 ft. by 6 in?
3. Find the area of the four walls of a room 15 ft. by 12 ft. if the walls are 13 ft. high.
4. A rectangular plot of land, 20 yd. long and  $13\frac{1}{2}$  ft. wide, is surrounded by a hoarding 10 ft. high. Find the total area of wood used in making the hoarding.
5. All round a room, 8 ft. by 9 ft., is a skirting board 9 in. high. Find the total area of this board.
6. How much wood is used in making a drawer 16 in. wide by 18 in. long and  $4\frac{1}{2}$  in. deep?
7. A tank is 4 ft. 6 in. long, 3 ft. wide, and 1 ft. 6 in. deep. How much lead sheeting would be required to cover the four sides and the bottom?
8. A crate without a lid is 5 ft. long and  $2\frac{1}{2}$  ft. wide. If it is 3 ft. deep, find what area of wood was used in making it.

B

*Areas of Triangles*

1. Find the areas of these triangles.
 

|     |      |                    |        |                    |
|-----|------|--------------------|--------|--------------------|
| (a) | Base | 6 in.              | Height | 8 in.              |
| (b) | "    | 5 in.              | "      | $2\frac{1}{2}$ in. |
| (c) | "    | $8\frac{3}{4}$ in. | "      | $3\frac{1}{4}$ in. |
2. Find the areas of the following triangles A, B and C.



For more sums, see page 43.

| A                                         | B                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------|
| 1. 2 cubic yd. = cubic ft.                | 1. Find the volume of cube of 6 in. edge.                                             |
| 2. 1 cubic ft. = cubic in.                | 2. Find the volume of a box 3 in. by 2 in. by 1 in.                                   |
| 3. $\frac{1}{2}$ cubic ft. = cubic in.    | 3. How many cubic ft. in $\frac{1}{8}$ cubic yd.?                                     |
| 4. $\frac{3}{4}$ yd. at 4d. per inch.     | 4. How many cubic inches in $\frac{1}{8}$ cubic ft.?                                  |
| 5. $5\frac{1}{2}$ qt. at 3d. per pt.      | 5. The base of a box contains 9 sq. ft. Find its volume if its height measures 2 ft.  |
| 6. $1 - .09$ =                            | 6. Jack has twice as many marbles as Tom. If Jack has 38 how many have they together? |
| 7. $.7 \times 1\frac{1}{2}$ =             | 7. 17 cwt. at £1 10s. per ton.                                                        |
| 8. $64 \times 1s.$ 3d. =                  |                                                                                       |
| 9. $4\frac{1}{2}d. \times 8\frac{1}{2}$ = |                                                                                       |
| 10. $\frac{1}{2}$ ton $\div$ 2 stones =   |                                                                                       |

## VOLUME

1. Find the volumes of rectangular blocks with the following measurements:—
 

|                                                       |                                                      |
|-------------------------------------------------------|------------------------------------------------------|
| (a) 8 in. $\times$ 4 in. $\times$ 5 in.               | (b) $3\frac{1}{2}$ ft. $\times$ 2 ft. $\times$ 1 ft. |
| (c) $2\frac{1}{4}$ in. $\times$ 1 in. $\times$ 12 in. | (d) $1\frac{1}{2}$ ft. $\times$ 8 in. $\times$ 9 in. |
| (e) $1\frac{1}{2}$ yd. $\times$ 2 ft. $\times$ 2 ft.  | (f) 1 yd. $\times$ $1\frac{1}{2}$ ft. $\times$ 8 in. |
2. Reduce to cubic inches:
 

|                 |                               |                 |
|-----------------|-------------------------------|-----------------|
| (a) 3 cubic ft. | (b) $10\frac{1}{2}$ cubic ft. | (c) 1 cubic yd. |
|-----------------|-------------------------------|-----------------|
3. How many cubic feet are there in:
 

|                  |                              |                              |
|------------------|------------------------------|------------------------------|
| (a) 12 cubic yd. | (b) $1\frac{2}{3}$ cubic yd. | (c) $5\frac{3}{4}$ cubic yd. |
|------------------|------------------------------|------------------------------|
4. Reduce 15552 cubic in. to cubic ft.
5. How many cubic yards are there in a tank measuring 6 ft. by 8 ft. by 9 ft.?
6. A rectangular figure was 2.4 in. high, 3 in. long and 2 in. wide. Find its volume.
7. 40 boys are in a classroom which measures 21 ft. by 24 ft. by 25 ft. How many cubic feet is this for each boy?
8. The bottom of a box measures  $6\frac{1}{2}$  sq. ft. What is its volume if the height is  $1\frac{1}{8}$  ft.?
9. How many carts would be required to shift a bank of earth 20 yd. long, 10 yd. wide and 2 yd. high, if each cart can take 2 cubic yards?
10. A piece of wood measures 6 ft. by 2 ft. by 2 in. Find its weight if each cubic inch weighs  $\frac{1}{8}$  oz.

*Note:—*

- 1 pint of water weighs  $1\frac{1}{4}$  lb.
  - 1 cubic foot of water weighs  $62\frac{1}{2}$  lb.
  - 1 cubic foot of water measures  $6\frac{1}{4}$  gallons.
- 

*A*

1. Find the volume of a block 6.2 in. long, 4 in. wide and 2 in. high.
2. How many gallons are there in a cistern measuring 6 ft. by 4 ft. by 3 ft.?
3. How many cardboard boxes, each  $6\frac{1}{2}$  in. by 3 in. by 2 in., can be packed in a crate measuring 1 ft. 1 in. by 1 ft. by 1 ft.?
4. If the base of a tank measures 12 sq. ft. and the height 5 ft., find the volume.
5. How many pounds of water can be held by a tank measuring 3 ft. by 2 ft. 6 in. by 2 ft.?
6. A carton holding 8 oz. of cornflakes measures 3 in. by 8 in. by 6 in. What weight of cornflakes can be packed in 2 cubic feet?
7. On each of the six sides of a box which measures 6 in. by 6 in. by 4 in., an oblong 3 in. by 2 in. is painted black. What fraction of the total surface is black?

*B*

1. How many bricks each 4 in. by 3 in. by 1 in. will be required to fill a box 4 ft. by 3 ft. by 1 ft.?
2. What weight of water can be carried in a tank measuring 7 ft. by 8 ft. by 4 ft.? Give your answer in hundredweights.
3. A room is 22 ft. square and the walls are 15 ft. high. How many square yards are there in the walls and the ceiling?
4. I have two boxes. One is a cube with an 8 in. edge; the other measures 10 in. by 6 in. by 4 in. By how much does the surface area of one exceed the surface area of the other?
5. A cistern measuring 4 ft. by 4 ft. by 3 ft. is leaking at the rate of 3 pints per minute. How long will it take to empty?
6. A box holding half a dozen tennis balls measures 8 in. by  $5\frac{1}{2}$  in. by 3 in. How many balls are there in a carton which is 22 in. high if it stands on a base 2 ft. square?
7. A coal-shed 5 ft. by 3 ft. is  $4\frac{1}{2}$  ft. high. Its top is made of wood. Also, there is a wooden door 2 ft. by  $4\frac{1}{2}$  ft. The rest is of brick. What area of wood is there?

Work out:

A

- |                               |                                          |                                       |
|-------------------------------|------------------------------------------|---------------------------------------|
| 1. $\frac{17}{100}$ of 125    | 8. $\frac{3}{4}$ of 5 yd.                | 15. $\cdot 35$ of 5s.                 |
| 2. $\frac{4}{15}$ of 1000     | 9. $\frac{2}{7}$ of $1\frac{3}{4}$ ton.  | 16. $\cdot 8$ of 2s. 6d.              |
| 3. $\frac{3}{4}$ of £5.       | 10. $\frac{5}{12}$ of 9 gall.            | 17. $\cdot 325$ of £1.                |
| 4. $\frac{2}{5}$ of £6 15s.   | 11. $\frac{1}{5}$ of $\frac{1}{2}$ acre. | 18. $\cdot 64$ of 25s.                |
| 5. $\frac{7}{8}$ of £7.       | 12. $\frac{1}{6}$ of 11 yd.              | 19. $\cdot 45$ of £1.                 |
| 6. $\frac{19}{20}$ of £3 10s. | 13. $\cdot 375$ of 18                    | 20. $1\cdot 5$ of $1\frac{1}{4}$ ton. |
| 7. $\frac{7}{16}$ of 880 yd.  | 14. $\cdot 675$ of 20                    | 21. $\cdot 125$ of 1 cubic ft.        |

## APPROXIMATION

B

- Express £16 3s.  $9\frac{1}{4}$ d. to the nearest
  - pound.
  - shilling.
  - penny.
- Express 14 yd. 2 ft.  $3\frac{3}{4}$  in. to the nearest
  - yard.
  - foot.
  - inch.
- Express £7 10s.  $5\frac{1}{2}$ d. to the nearest
  - pound.
  - shilling.
  - penny.
- Express the following decimals correct (a) to the nearest third place (b) to the nearest whole number.
 

|             |             |             |
|-------------|-------------|-------------|
| (a) 6.7243  | (b) 2.4187  | (c) 3.5965  |
| (d) 14.9001 | (e) 10.9998 | (f) 12.0003 |
- Divide £1 17s.  $2\frac{1}{4}$ d. by 13, giving your answer to the nearest penny.
- A journey of 148 miles costs 18s. 3d. How much is this per mile? Give your answer to the nearest farthing.

## REMAINDERS, etc.

C

*In each of the following sums, work out the remainder when the amount in column (a) is divided by the amount in column (b).*

- | a                  | b                 | a              | b           |
|--------------------|-------------------|----------------|-------------|
| 1. £1              | 1s. 6d.           | 5. £2 10s. 9d. | 10s. 6d.    |
| 2. $10\frac{2}{3}$ | $2\frac{1}{5}$    | 6. 20 yd.      | 2 ft. 9 in. |
| 3. 1064            | 381               | 7. 1 qr.       | 10 oz.      |
| 4. 35 gall.        | $\frac{3}{4}$ pt. | 8. 27 acres.   | 480 sq. yd. |
- A piece of cloth 12 yd. long is divided into pieces each 1 ft. 9 in. long. How many inches are left over?
  - What is the least number that can be added to 10000 to make it exactly divisible by 17?

*A*

1. 19s. 11d.  $\times 48$  =
2. 9s. 6d.  $\times 40$  =
3. Reduce  $1\frac{3}{4}$  guineas to shillings
4.  $\frac{1}{2}$  ton at 1s. per lb.
5.  $\frac{3}{16}$  of £5 =
6. How many days in 1956?
7.  $.01 \times .6 \times 1.2$  =
8.  $.012 \div .4$  =
9.  $\frac{3}{4} \times .05$  =
10. .2 of 8s. 4d. =

*B*

1. Find cost of 6 ft. 9 in. at 1s. 6d. per yd.
2. £21 6s. 7d. + £3 2s.  $2\frac{1}{2}$ d. — £4.
3. 7 pencils at 9s. per gross.
4. What decimal fraction of £1 is 1s.?
5. Change  $\frac{1}{16}$  to a decimal.
6. Change .525 to a vulgar fraction.
7. How many minutes from 9.35 a.m. to 12.50 p.m.?
8. How many days were there in the first 3 months of 1900?

PROBLEMS

*A*

1. What number multiplied by 8.9 will give the same result as 44.5 multiplied by 5.7?
2. A boy multiplied a decimal fraction by  $3\frac{1}{2}$  and added 1.08 to the product. His final answer was 1.38. With what fraction did he start?
3. Write the following as decimals and find their sum:— $3\frac{4}{5}$ ,  $\frac{173}{10}$ ,  $8\frac{19}{20}$ , and  $17\frac{132}{25}$ .
4. How many people could receive £6 3s. 6d. out of £104 19s. 6d.?

*B*

1. A passenger train and a goods train start at the same time. When the passenger train has gone 35 miles, the goods train has gone 30 miles. How far will the passenger train have gone when the goods train has gone 100 miles?
2. A box, when empty, weighs  $\frac{2}{7}$  as much as the goods that can be packed in it. If the total weight of the box and its contents is 54 lb., find the weight of the box when empty.
3. A woman bought three lengths of cloth: (a) 5 yd. for 9s.  $10\frac{3}{4}$ d. (b)  $3\frac{1}{2}$  yd. for 7s. (c) 4 yd. 2 ft. for 9s. 11d. Find the cost per yard of the cheapest cloth.
4. What fraction of the sum of  $2\frac{1}{2}$  and  $2\frac{1}{3}$  is their difference?

*Find the cost of*

- I.  $2\frac{1}{2}$  lb. at 1s. 2d. per lb.  
5 lb. at  $5\frac{1}{2}$ d. per lb.  
2 doz. articles at 1s. 9d. per doz.  
 $\frac{1}{4}$  lb. at 1s. 8d. per lb.
3. 1 stone at  $3\frac{1}{2}$ d. per lb.  
20 articles at 1s. 6d. per doz.  
 $1\frac{1}{2}$  lb. at 1s. 8d. per lb.  
1 stone at 5d. per lb.
5. 3 yd. at  $6\frac{3}{4}$ d. per yard.  
 $1\frac{1}{2}$  yd. at 3s. 11d. per yd.  
 $3\frac{1}{2}$  doz. at  $6\frac{1}{2}$ d. per doz.  
2 doz. at 2 for 3d.
7. 3 articles at 3s. 6d. per doz.  
 $3\frac{1}{2}$  yd. at 5s. 11d. per yd.  
 $1\frac{1}{2}$  doz. at 6s. 3d. per doz.  
4 articles at 1s. 11d. each.
9.  $3\frac{1}{4}$  lb. at 1s. 8d. per lb.  
 $1\frac{3}{4}$  lb. at 1s. 4d. per lb.  
11 oz. at 1s. per lb.  
1 lb. 5 oz. at 1s. 4d. per lb.
- II.  $2\frac{1}{2}$  lb. at  $5\frac{1}{2}$ d. per lb.  
 $4\frac{1}{4}$  lb. at 1s. 2d. per lb.  
5 oz. at 8d. per lb.  
1 lb. 6 oz. at 2s. per lb.
13. 2 gall. at  $3\frac{1}{2}$ d. per pt.  
2 doz. and 7 arts. at 1s. 6d. per doz.  
1 gallon at 1s. 6d. per pint.  
 $1\frac{3}{4}$  lb. at 1s. 2d. per lb.
15.  $\frac{3}{4}$  lb. at 10d. per lb.  
 $1\frac{1}{2}$  stone at  $1\frac{1}{2}$ d. per lb.  
3 lb. 7 oz. at 8d. per lb.  
1 lb. 10 oz. at 1s. per lb.

*Find the cost of*

2. 3 doz articles at  $1\frac{1}{2}$ d. each.  
15 articles at  $\frac{3}{4}$ d. each.  
125 articles at 1s. per hundred.  
30 articles at 5d. per doz.
4.  $3\frac{1}{2}$  pints at 7d. per pint.  
6 quarts at 11d. per gallon.  
 $2\frac{1}{2}$  gallons at  $\frac{3}{4}$ d. per pint.  
3 pints at 5d. per quart.
6.  $2\frac{1}{4}$  lb. at 3d. per lb.  
12 oz. at 2s. per lb.  
1 lb. 4 oz. at 5d. per lb.  
 $3\frac{3}{4}$  lb. at 6d. per lb.
8. 8 lb. at  $11\frac{3}{4}$ d. per lb.  
 $7\frac{1}{4}$  lb. at 1s. 6d. per lb.  
 $5\frac{1}{2}$  stone at 1d. per lb.  
 $4\frac{1}{2}$  lb. at 9d. per lb.
10. 3 yd. at  $11\frac{1}{2}$ d. per foot.  
4 ft. at 2s. per yard.  
14 yd. at  $2\frac{1}{2}$ d. per yard.  
16 yd. at  $5\frac{3}{4}$ d. per yard.
12.  $2\frac{1}{2}$  ton at 15s. per ton.  
18 cwt. at 10s. per ton.  
3 qr. at 9s. per cwt.  
 $1\frac{1}{2}$  ton at 2s. 6d. per qr.
14. 17 articles at 2s. 6d. each.  
13 „ at 3s. 4d. each.  
16 „ at 6s. 8d. each.  
19 „ at 10s. each.
16. 20 articles at  $5\frac{3}{4}$ d. each.  
5 „ at  $6\frac{1}{4}$ d. each.  
12 „ at  $11\frac{1}{2}$ d. each.  
18 „ at 1s.  $0\frac{1}{2}$ d. each.

For more sums, see page 44.

## A

1. Share 230 marbles between Jack and Fred, giving Fred 16 more than Jack.
2. Divide £1 into 2 parts, one 1s. more than the other.
3. Divide £5 into 2 parts, one £2 10s. more than the other.
4. Divide 10s. into 2 parts, one 6d. less than the other.
5. Divide £3 17s. 6d. into 2 parts, one 1s. 6d. more than the other.
6. Father gave £100 in all to his two sons. The elder received £10 more than the younger. How much did each receive?
7. Mr. Jones and Mr. Brown ordered similar lunches, except that Mr. Jones had coffee and Mr. Brown did not. The coffee cost 3d. If the total bill came to 5s. 9d., what should each pay?

## B

1. A grocer should have divided his tea into two equal lots, each lot weighing 125 lb. By mistake, one lot was 4 lb. heavier than the other. Find the weight of the heavier lot.
2. The perimeter of a rectangular field is 160 yards. The length is 10 yards more than the width. Find the length.
3. Divide 1 mile into 3 parts, the first part 110 yards more than the second, and the second 330 yards more than the third.
4. Divide 6 ton into 3 loads, the first load 20 cwt. less than the second, and the second 20 cwt. less than the third.
5. Aunt shared 5 guineas among her three nephews. She gave John half a crown more than Alec and two shillings less than Sidney. What did Sidney receive?
6. Mr. Jack and Mr. Stokes shared a plot of land 800 square yards in area. This plot was in 3 parts. One small part measured 42 ft. by 36 ft. The two larger parts were equal to each other. Mr. Jack took the small part and one large part. How many square yards did he have?
7. Two fruiterers together bought 344 lb. of fruit for £8 12s. In sharing, one man had 56 lb. less than the other. How much money should each man pay?

## Mental Sums

A

1.  $33\frac{1}{3}\%$  =
2.  $2\frac{1}{2}\%$  =
3.  $12\frac{1}{2}\%$  =
4.  $66\frac{2}{3}\%$  =
5.  $\frac{1}{2}\%$  =
6.  $7\frac{1}{2}\%$  =
7.  $60\%$  =
8.  $\frac{1}{3}\%$  =
9.  $\frac{1}{4}\%$  =
10.  $35\%$  =

1. Find 25% of 140.
2. If I spend 20% of £1, what remains?
3. What shall I pay for an article marked 50s. if a discount of 5% is allowed?
4. In a school were 300 children. 40% were girls. How many boys?
5.  $\frac{1}{2}\%$  of 8s. 4d. =
6. 20% of £1 +  $12\frac{1}{2}\%$  of 2s. =
7. Out of 1000 eggs, 5% were cracked. How many were whole?

1. Change the following fractions to percentages.

$\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{1}{3}, \frac{2}{3}, \frac{1}{6}, \frac{1}{8}, \frac{3}{8}, \frac{5}{8}, \frac{7}{8}, \frac{1}{10},$   
 $\frac{3}{10}, \frac{7}{10}, \frac{9}{10}, \frac{1}{25}, \frac{1}{50}, \frac{1}{100}, \frac{37}{100}, \frac{5}{16}, \frac{14}{25}.$

2. Change the following decimal fractions to percentages.

.31, .89, .25, .5, .75, .8, .375, .625, .1, .9, .3,  
 .04, .02, .01, .4, .6, .72, .85, .34.

3. Change the following percentages to decimal fractions.

50%, 75%, 10%, 15%,  $12\frac{1}{2}\%$ ,  $37\frac{1}{2}\%$ ,  $62\frac{1}{2}\%$ , 90%,  
 3%, 1%, 40%, 28%, 64%, 85%.

4. Work out

(a) 10% of 15                      (b) 90% of 50                      (c)  $12\frac{1}{2}\%$  of 32  
 (d) 7% of 125                      (e) 64% of 75                      (f) 1% of 1

5. What percentage is

(a) 12 of 15?                      (b) 75 of 80?                      (c) 8 of 10?  
 (d) 64 of 65?                      (e) 7 of 1000?                      (f) 1 of 200?

6. Work out

(a) 17% of 8s. 4d.                      (b) 24% of 4s. 2d.                      (c) 15% of 10 cwt.  
 (d)  $37\frac{1}{2}\%$  of 5 gall.                      (e) 60% of  $\frac{1}{2}$  mile.                      (f)  $87\frac{1}{2}\%$  of 2 cubic ft.

7. What percentage is

(a) 15s. 6d. of £1?                      (b) £3 10s. 3d. of £5?                      (c) 8d. of 2s.?  
 (d) 1s. 6d. of 8s.?                      (e) 5 pints of 2 gall.?                      (f) 110 yd. of  $\frac{1}{2}$  mile?

8. Work out the following percentages of £1

(a) 5%, (b)  $2\frac{1}{2}\%$ , (c)  $1\frac{1}{4}\%$ , (d)  $3\frac{3}{4}\%$ , (e)  $12\frac{1}{2}\%$ , (f) 35%.

9. Complete the following

(a) 12s. 6d. is 5% of.....                      (b) 3 cwt. 2 qr. is  $12\frac{1}{2}\%$  of.....  
 (c) 1 gall. is  $66\frac{2}{3}\%$  of.....                      (d) 1 ft. 9 in. is  $87\frac{1}{2}\%$  of.....

For more sums, see page 46.

| A                                                                 | B                                                                                   |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1. $234 \times 11$ =                                              | 1. Reduce $\frac{76}{95}$ to lowest terms.                                          |
| 2. $.26 \times 6 \times .01$ =                                    | 2. What fraction of a cake is left when $\frac{3}{10}$ and $\frac{1}{4}$ are eaten? |
| 3. $\pounds \frac{4}{5} + \pounds \frac{1}{16}$ =                 | 3. Divide 18s. 9d. by 1s. 3d.                                                       |
| 4. $\frac{1}{3} \times \frac{1}{9} \times \frac{1}{5} \times 3$ = | 4. Work out $\frac{7}{16}$ of £2.                                                   |
| 5. Change £21 to guineas.                                         | 5. What fraction of $2\frac{1}{2}$ miles is 3 furlongs?                             |
| 6. $19\text{s. } 11\frac{1}{2}\text{d.} \times 36$ =              | 6. Express 16s. 6d. as a decimal of £1.                                             |
| 7. 48 lb. at $2\frac{3}{4}\text{d.}$ per lb.                      | 7. How many times can .012 be taken from .36?                                       |
| 8. 6 score at 3 for 5d.                                           | 8. Length= $6\frac{1}{2}$ yd. Width=72 in. Find area.                               |
| 9. $\frac{3}{4}$ cwt. at $1\frac{1}{2}\text{d.}$ per lb.          |                                                                                     |
| 10. Express $\frac{19}{40}$ as a decimal.                         |                                                                                     |

PROBLEMS

- A
- Write down the next three numbers in the series:—25,  $12\frac{1}{2}$ ,  $6\frac{1}{4}$ , . . .
  - A woman had 10.5 metres of silk worth 15.8 francs per metre. She used 3.8 metres. Find the value of the silk left.
  - What number must be multiplied by .05 to make .0125?
  - A pen and a nib cost 5d. A pen and three nibs cost 6d. What is the cost of each nib?
  - In a city were half a million people. On a flag day, half of them paid 2d. each and half the rest 3d. each. The others did not contribute. How much was collected?
- B
- Find the continued product of 8, 2, .5 and .125.
  - A hoarding made of planks 18 in. wide surrounds a field which is 60 ft. square. If the hoarding is 8 ft. high, what length of timber was used in making it?
  - A man bought 100 eggs at 2 for  $7\frac{1}{2}\text{d.}$  He sold a quarter of them at  $4\frac{1}{2}\text{d.}$  each, a half at  $4\frac{1}{4}\text{d.}$  each, and the rest at 4d. each. How much did he gain?
  - Out of a class of 40 children, 1 child in every ten was absent. What percentage was present?
  - A boy had a stick which he thought was 1 yard long. It was really  $\frac{1}{2}$  inch short. He measured a path and said it was 48 feet long. What was the actual length of the path?

## A

1.  $9\text{s. } 11\frac{1}{2}\text{d.} \times 48 =$
2.  $\cdot 12 \div \cdot 004 =$
3.  $\cdot 35 \text{ of } 10\text{s.} =$
4.  $\frac{1}{3} + \frac{1}{4} - \frac{5}{12} =$
5.  $8 - \cdot 8 =$
6.  $1\cdot 6 \times \cdot 01 \times \cdot 004 =$
7.  $13\frac{1}{2} \div \frac{3}{4} =$
8.  $125 \times 25 =$
9.  $16\cdot 5 \times 25 =$
10.  $\cdot 96 \div 100 =$

## B

1. If  $\frac{3}{8}$  of my money equals 2s. 6d., find the whole.
2. If  $\cdot 85$  of my money equals £17, find the whole.
3. After spending  $\frac{2}{5}$  of his money a boy had 5s. left. What had he at first?
4.  $\frac{1}{2}$  cwt. costs 1s. 6d. Find the cost of  $\frac{1}{2}$  ton.
5. How often is 1s. 8d. contained in £4 15s.?
6. How many square inches are required to make a paper box 2 in. by 2 in. by 2 in?
7.  $\frac{1}{5}$  of my money is copper and the rest silver. If 5s. is silver how much copper have I?

## FRACTIONS AND DECIMALS

## A

1. A woman spent  $\frac{1}{3}$ ,  $\frac{1}{6}$  and  $\frac{1}{4}$  of her money. She had 1s. 6d. left. What had she at first?
2. A man left  $\frac{2}{3}$  of his money to his wife,  $\frac{1}{4}$  to his son and  $\frac{1}{8}$  to his daughter and the rest to charity. If he left £500 what amount went to charity?
3. A woman spent  $\cdot 25$  of her money on sugar,  $\cdot 5$  on meat and  $\cdot 125$  on cakes. She then had 2s. 6d. left. What did she spend on sugar?
4. Mr. Brown bequeathed half his money to Mr. Jones. Mr. Jones banked  $\frac{1}{4}$  of his share, spent  $\frac{2}{3}$  in buying a car and had £100 left. What amount did Mr. Brown leave?

## B

1.  $\cdot 25$  of the money for a party was spent on cakes;  $\cdot 5$  of the remainder was spent on sweets. The rest, which amounted to £4, was spent on toys. How much money was spent on the party?
2. Jane had 900 beads. She used  $\frac{1}{3}$  of them in making a bag, and a  $\frac{1}{4}$  of the remainder she gave to her sister. How many beads had she left?
3. A tank was  $\frac{2}{3}$  full of water. 30 gall. were then drawn off, leaving the tank  $\frac{1}{4}$  full. How much water was in the tank at first?
4. A woman spent  $\cdot 125$  of her money in one shop, 2s. 6d. in the next and had  $\cdot 8$  of her money left. What had she at first?

## A

*What fraction is*

- I. 75 of 125.
2. 100 of 75.
3. 8d. of 1s. 6d.
4. 3 fur. of  $\frac{1}{2}$  mile.
5. £1 of 16s. 8d.
6. 2s. of 5s. 4d.
7.  $2\frac{1}{2}$  qt. of 1 gall.
8.  $12\frac{1}{2}$  cwt. of 1 ton.
9.  $3\frac{1}{2}$  of  $4\frac{1}{2}$ .
10.  $3\frac{1}{3}$  of  $10\frac{1}{6}$ .
11.  $5\frac{1}{3}$  of  $3\frac{1}{5}$ .
12. £1 7s. 6d. of £2 7s. 6d.

13. £1 8s. of £3 12s.

14.  $11\frac{3}{4}$ d. of 2s.

15. 5s. of £1 1s. 8d.

16. 15 cz. of 2 lb.

*What fraction of*

17. 3·5 is 2·8.

18. 3 is ·15.

19. 8 is ·08.

20. 1·45 is  $6\frac{2}{10}$ .21. 30s. is  $4\frac{1}{2}$ d.

22. 2 yd. is 2 ft. 3 in.

23. 6050 sq. yd. is 2 acres.

24. 1 cubic yd. is  $6\frac{3}{4}$  cubic ft.

## B

- I. Change to decimal fractions the last 8 answers in Section A.
2. Mary had half a crown. She spent 4d. What fraction of her money was left?
3. I went out with £5. I bought 3 books each worth 7s. 6d., and a fountain pen for 10s. 6d. What decimal fraction of my money was left?
4. A man who earns £7 10s. per week pays £29 5s. per year in taxes. What fraction of his money does he pay in taxes?
5. A man buys a copy of the "Radio Times" at 2d. each week and a magazine at 3d. every other week.
  - (a) How much does he spend on both papers in a year?
  - (b) What fraction of the money is spent on the magazines?

## C

- I. A man bought 240 eggs. He bought 120 at 3d. each, half the remainder at  $3\frac{3}{4}$ d. each and the rest at  $4\frac{1}{2}$ d. each. What fraction of the total money was spent on the 3d. eggs?
2. A farm has an area of  $\frac{1}{4}$  square mile. The farmer puts 40 acres under wheat. He grows turnips on  $37\frac{1}{2}$  acres. The rest is meadow land. What fraction of his land is meadow?
3. On a sheet of paper 8 in. square a boy paints a rectangle  $6\frac{1}{2}$  in. by 4 in. What decimal fraction of the paper is not painted?
4. A jug contained 3 pt. of a mixture of milk and water. One half of the mixture was milk. 2 pt. of water were then added. What fraction of the mixture is milk?

## A

1. Divide £5 in the proportion of  
 (a)  $2 : 1$ .                      (b)  $3 : 1$ .                      (c)  $4 : 1$ .
2. Divide 12 cwt. in the proportion of  
 (a)  $3 : 1$ .                      (b)  $7 : 1$ .                      (c)  $5 : 1$ .
3. Divide 3 guineas in the proportion of  
 (a)  $1 : \frac{1}{2}$ .                      (b)  $1 : \frac{1}{3}$ .                      (c)  $1 : \frac{1}{5}$ .
4. Divide £2 12s. 6d. in the proportion of  
 (a)  $1 : \cdot 5$ .                      (b)  $1 : \cdot 25$ .                      (c)  $1 : \cdot 2$ .
5. Divide 15s. into two parts, the first part 4 times as large as the second.
6. Divide 10 gallons into two parts so that the smaller part equals  $\frac{1}{3}$  of the larger part.
7. Divide  $4\frac{1}{2}$  yards into two parts, the first part being 5 times as large as the second.
8. Share 2s. 6d. between John and Mary, giving John twice as much as Mary.

## B

1. Divide 1 guinea between Smith and Brown so that for every 5d. Smith receives Brown receives 4d.
2. Tom and Arthur together receive £1 15s. Tom works 8 hours and Arthur 7 hours. How much does Tom receive?
3. A man paid £45 for two fields. One was  $\frac{1}{4}$  the size of the other. Find the price of the larger field.
4. A tennis racquet cost £1 8s. The frame was worth  $\frac{3}{4}$  as much as the strings. How much was the frame worth?
5. Smith and Jones bought a business for £700. For every £2 Smith paid, Jones paid £3. How much did Smith pay?
6. In making concrete, I mixed 4 parts of sand with 1 part of cement. Altogether, I used  $52\frac{1}{2}$  cubic feet of material. How much sand did I use?
7. A grocer had some 1-lb. packets of tea and an equal number of  $\frac{1}{2}$ -lb. packets. The total weight of tea was 30 lb. How many packets were there?
8. A man rode from his home in a car and walked back. The speed of the car was eight times the speed at which he walked. The total journey took  $4\frac{1}{2}$  hours. For how many hours was he walking?

For more sums, see page 48.

## A1

1. Divide £72 17s. 10½d. by 29.
2. Multiply the sum of  $1\frac{3}{8}$  and  $2\frac{7}{12}$  by  $2\frac{2}{5}$ .
3.  $71.3 \times 5.05$ .
4. How many pieces each 2 in. long can be cut from a thread which is  $15\frac{1}{2}$  yd. long?
5. Three men each give  $1\frac{1}{2}$  guineas to a fund. How much more money is required to make the fund total £6?

## A2

1. Multiply two thousand and five by one hundred and nine.
2. Divide 9999 by 11.
3. 1s. 8d.  $\times 37$ .
4. Take  $1\frac{2}{3}$  from  $3\frac{1}{4}$ .
5. What fraction is 3s. 4d. of 16s. 8d.?
6. Find the cost of 1 gall. 1 pt. at 6d. per gall.
7. Find the cost of 12 score of toys at 9d. per doz.
8. Reduce 5 ton 12 cwt. 1 qr. to quarters.
9.  $3.16 + 4.009 - 2.41$ .
10.  $165 \times 25$ .
11. What decimal fraction of £5 is 25s.?
12.  $2\frac{1}{2} \times 1\frac{1}{3}$ .
13. Find the cost of 27 in. at 2s. 6d. per yd.
14. How many threepences are there in £1 9s. 9d.?
15. Find the area of a square whose side measures  $1\frac{1}{4}$  in.

## A3

1. Divide 323.466 by 11.
2. Multiply £3 17s. 5½d. by 81.
3. Add up

| tons | cwt. | qr. |
|------|------|-----|
| 8    | 15   | 3   |
| 2    | 9    | 2   |
| 13   | 14   | 1   |
| 20   | 0    | 3   |
| 33   | 12   | 1   |

4. Reduce 15 yd. 2 ft.  $10\frac{1}{2}$  in. to half-inches.
5.  $(3\frac{3}{4} + 4\frac{9}{10}) - (2.9 + 2.8)$ .
6. What decimal fraction of £5 is  $\frac{3}{4}$  of 16s.?
7. If 13 oz. cost 2s. 5½d., find the cost of 1 lb.

For more Examination Papers, see pp. 54—64.

## A1

1. Find  $\frac{5}{9}$  of £28 3s. 3d.
2.  $52078 \div 26$ .
3. Find the value of
  - (a)  $\frac{1}{4} + \frac{5}{6} - \frac{1}{2}$ .
  - (b)  $(\frac{2}{3} \text{ of } \frac{6}{7}) + \frac{5}{21}$ .
4. (a) 7 eggs at 2s. 3d. per doz.
- (b) 1 lb. 5 oz. at 1s. 4d. per lb.
- (c)  $1\frac{3}{4}$  lb. rice at 1s. 2d. per lb.
- (d)  $1\frac{1}{2}$  pt. of milk at 4s. per gall.
- (e) 3 tins of milk at  $3\frac{1}{2}$ d. per tin.
- (f) 1 doz. lemons at 2 for  $1\frac{1}{2}$ d.

## A2

1.  $14021 \div 7$ .
2. £2 5s. 2d.  $\times 7$ .
3.  $\frac{1}{2} + \frac{1}{4} + \frac{1}{6}$ .
4. Reduce 1 gall. 3 qt. 1 pt. to pints.
5.  $2.06 \times 3.4$ .
6.  $.012 \div 6$ .
7. One gross of toys at  $1\frac{1}{2}$ d. each.
8. What fraction is 2s. 6d. of £1 2s. 6d.?
9. Express as a vulgar fraction  $.03 + .6$ .
10. 20 yd. of string at  $\frac{3}{4}$ d. per yd.
11. If  $\frac{2}{3}$  of my money is 3s. 4d., find the whole.
12. 1 lb. 12 oz. of dates at 1s. 4d. per lb.
13. If 4 boys are absent from a class of 36, what fraction is present?
14. Mary had 2s. 6d. John had 1s. 3d. more than Mary. How much had they altogether?
15. 1 mile—220 yd.

## A3

1. Take one thousand and thirteen from two thousand and seven.
2. Divide £130 11s.  $1\frac{1}{4}$ d. by 13.
3. Simplify  $(3\frac{1}{8} - \frac{2}{3}) + (2\frac{1}{6} - \frac{3}{4})$ .
4. What decimal fraction of 4s. 8d. is .7 of 1s. 8d.?
5. Find the cost of 1 cwt. 2 qr. 14 lb. at 6d. per stone.
6. Find the cost of each inch if  $5\frac{3}{4}$  yd. cost 12s.  $11\frac{1}{4}$ d.
7. An oblong 1 in. wide has a perimeter measuring 7 in. Find its area.

For more Examination Papers, see pp. 54—64.

## A1

1.  $38 \times 17$ .
2.  $42039 \div 9$ .
3.  $\frac{1}{8}$  of £13 10s. 6d.
4. 5 yd. 2 ft.  $4\frac{1}{2}$  in.  $\div 3$ .
5.  $37201 + 4001 - 2000$ .
6. Work out  $(\frac{3}{8} + \frac{7}{10})$  and give the answer as a decimal.
7. Work out  $\frac{10 \div 5}{1 \div 5}$ , and give the answer as a vulgar fraction.
8. What fraction of £5 is £1 10s. 0d.?
9. Divide 5 ton 15 cwt. by 1 ton 3 cwt.
10. Of 420 children in a school, 112 are in the Infants' Department. What fraction of the children are in the other departments?
11. Change 5 yd. 2 ft. 11 in. to inches.
12. If 504 pint bottles are filled from 64 gallons, how many pints are left?
13. How many minutes from 4.15 p.m. to 8.30 p.m. on the same day?
14. Find the cost of 48 yd. at  $3\frac{3}{4}$ d. per yd.
15. Take £2 14s.  $10\frac{1}{2}$ d. from £4.

## A2

1. £44 7s.  $6\frac{1}{4}$ d.  $\div 29$ .
2. Work out  $(3\frac{1}{2} \times 2\frac{1}{3}) + (1\frac{1}{2} \times 1\frac{2}{3})$ .
3. Add 1.41 to 2.19 and multiply the answer by  $3\frac{1}{2}$ .
4. If each child in a school gives  $1\frac{1}{2}$ d., and £5 10s. 9d. is collected in this way, how many children are there in the school?
5. How much must be added to  $\frac{5}{7}$  of 2 guineas to make £2?

## A3

1. By how much is 2 ton 16 cwt. 1 qr. greater than 1 ton 9 cwt. 2 qr.?
2. Multiply £5 3s. 6d. by 11.
3. How many half-pints are there in 9 gallons 1 qt. 1 pt.?
4. Take  $3\frac{2}{3}$  from  $6\frac{1}{4}$ .
5. Add up 3.1, .13, and 1.03.
6. Find the cost of
  - (a) 15 lb. at  $3\frac{1}{4}$ d. per lb.
  - (b)  $1\frac{1}{2}$  gallons at 1s. 7d. per gallon.
  - (c)  $1\frac{2}{3}$  yards at 2s. 6d. per yard.
  - (d)  $\frac{1}{2}$  gross at  $10\frac{1}{2}$ d. per doz.
  - (e)  $2\frac{1}{2}$  oz. at 2s. 8d. per lb.
7. If 1 lb. of a mixture contains  $\frac{1}{2}$  pint of water, how many gallons of water are there in 1 ton of mixture?

For more Examination Papers, see pp. 54—64.

## A1

1. £27 16s. 2d.  $\times 46$ .
2. (a)  $0\cdot6 \times 24 \times 5$ .  
(b)  $16 - \cdot004 + 3\cdot76$ .
3. (a)  $2\frac{1}{2} + 3\frac{1}{6} + \frac{1}{5}$ .  
(b)  $3\frac{3}{7} \times 10\frac{1}{2}$ .
4.  $\frac{12s. \ 10d.}{11d.}$
5. The length of my step is 32 in. How far can I walk in 15 min. if I take 2 steps per second? Answer in yards.

## A2

- I. £1 6s. 3d.  $\times 5$ .
2. Find  $\frac{1}{5}$  of 18 gall. 0 qt. 1 pt.
3.  $\frac{3}{4} + \frac{1}{5} + \frac{1}{2}$ .
4.  $8\frac{5}{12} - 7\frac{11}{20}$ .
5. 112 lb.  $\div 1$  cwt. How many cwt. in 3528 lb.?
6. Find  $\frac{1}{4}$  of £7 12s.
7. Find the cost of 2 gall. of milk at  $1\frac{1}{2}$ d. per pt.
8. How many pint packets of peas can be supplied from  $3\frac{1}{2}$  gall.?
9.  $\cdot125$  of 2s.
10. If a clock ticks once in a second, how many times will it tick in  $1\frac{1}{2}$  hr.?
- II.  $3\cdot6 + 0\cdot4 + \cdot7$ .
12.  $7217 \div 7$ .
13. Find the area, in square yards, of a room 30 ft. long and 27 ft. wide.
14. 1 lb. 3 oz. at 2s. per lb.
15. How many halfpenny biscuits cost £1 10s. 0d.?

## A3

1. £136 17s. 3d.  $+$  £2 4s.  $9\frac{1}{2}$ d.  $+$  16s.  $7\frac{3}{4}$ d.  $-$  £5 0s.  $0\frac{1}{4}$ d.
2. (a)  $5\frac{5}{9} + 6\frac{7}{12} + 9\frac{8}{15}$ . (b)  $23\frac{5}{12} - 7\frac{1}{12}$ .
3. Reduce 12 cwt. 3 qr. to pounds and find how many 4-oz. packets could be made out of that weight of tea.
4. (a)  $\cdot06 \times 1\cdot3$ .  
(b)  $2\cdot6 - \cdot04 + 2\cdot38$ .  
(c)  $23\cdot4 \div \cdot25$ .
5. How many inches are there in  $\frac{1}{16}$  of a mile?

For more Examination Papers, see pp. 54—64.

## A1

1. Divide thirteen hundred and five by nine.
2. Add up two thousand and one, one hundred and ten, and thirty.
3. Work out  $\frac{1}{4}$  of £1 15s. 3d.
4. Multiply 1 yd. 2 ft.  $10\frac{1}{2}$  in. by 6.
5. Add up 2 hr. 15 min. 39 sec.  
and 3 hr. 59 min. 38 sec.
6.  $\begin{array}{r} 1339 \\ 13 \end{array}$
7. Take .05 from .9 and give your answer as a vulgar fraction.
8. Work out  $(\frac{1}{3} + \frac{1}{6} + \frac{1}{9})$ .
9. Out of 144 eggs, 15 were cracked. What fraction of the eggs were whole?
10. Change £1 15s. 2d. to twopences.
11. 5 eggs at 2s. 9d. per dozen.
12. 6 oranges at 4 for a shilling.
13. 4 gallons of milk at 6d. a pint.
14. 4 oz. at 3s. 6d. per lb.
15. 4 sq. yd. of carpet at 2s. 6d. per square foot.
16. 20 boxes at 9d. per dozen boxes.

## A2

1.  $35009 \times 28$ .
2. Add up  $2\frac{5}{6}$  and  $3\frac{1}{2}$  and divide your answer by  $1\frac{9}{10}$ .
3. Multiply 2 ton 15 cwt. 2 qr. by 8.
4. A racing car goes 90 miles per hour. How many yards is this per minute?
5. What fraction of £2 5s. 0d. is left after 3 books are bought at 7s. 6d. each?

## A3

1. £46 11s.  $11\frac{1}{4}$ d.  $\div 31$ .
2. Work out  $(9.01 + 3.7 + .8) - 9.23$ .
3. Divide the product of  $3\frac{1}{3}$  and  $2\frac{1}{2}$  by  $\frac{1}{6}$ .
4. How many square inches are there in  $1\frac{1}{3}$  square yards?
5. Add together 15 half-crowns, 31 sixpences and 145 pennies.

For more Examination Papers, see pp. 54—64.

## A1

1. 2 ton 3 cwt. 2 qr.  $\times 24$ .
2. Find  $\frac{3}{7}$  of £29 1s. 7d.
3. (a)  $0\cdot6 + 2\cdot4 + \cdot03$ .  
(b)  $0\cdot63 \times 2\cdot4$ .
4. (a)  $\begin{array}{r} 1s. \ 3d. \\ 5s. \ 0d. \end{array}$  (b)  $\begin{array}{r} 2s. \ 0d. \\ 3d. \end{array}$
5. How many flagstones each 4 ft. square will be required to cover a courtyard 10 yd. long and 8 yd. wide?

## A2

1. £19 16s.  $4\frac{1}{2}$ d. — £6 3s.  $6\frac{1}{4}$ d.
2. Reduce 2 gall. 1 qt. to pints.
3. Find the cost of 3 dozen halfpenny stamps.
4.  $0\cdot6 \times 20$ .
5.  $\cdot25 + \frac{1}{4}$ .
6. How many  $\frac{1}{2}$ -lb. packets of tea can be made from 1 qr. 13 lb.?
7. What will be left after I have spent  $\frac{3}{8}$  of half a crown?
8.  $3\frac{1}{3} \div 5\frac{5}{8}$ .
9.  $1\frac{1}{2}$  yd. of ribbon at  $\frac{1}{2}$ d. per inch.
10. Find the cost of 2600 apples at 5 for 1s.
11. Express  $\cdot1$  of 270 ft. in yards.
12. From a ball of string, 2 pieces each 2 yards long were cut off. If 20 ft. remained, what was the length of the ball at first?
13.  $1\frac{1}{2}$  dozen eggs at  $3\frac{1}{2}$ d. each.
14.  $1\frac{1}{2}$  lb. of sugar at 10d. per lb.
15. A score of balloons at 2d. each.

## A3

1. £26 9s. 4d.  $\times 23$ .
2. How many threepences in 4 guineas?
3. How many seconds between 9.36 a.m. and 11.40 a.m.?
4. (a)  $0\cdot63 \times 2\cdot8$ .  
(b)  $3\cdot6 \div \cdot024$ .
5. (a)  $4\frac{3}{7} + 1\frac{1}{3} + 2\frac{5}{9}$ .  
(b)  $13\frac{1}{12} - 4\frac{1}{8}$ .

For more Examination Papers, see pp. 54—64.

## B1

1. A man bought 5 doz. rubber balls at 13s. per doz. How many more could he have bought with the same money if the price had been 10s. per dozen?
2. A boy has a paper 8 in. square. On all four sides of it, he draws a border 2 in. wide. He covers this border with coloured paper 2 in. wide. What length of coloured paper will he use?
3. (a) 1 lb. 12 oz. at 2s. 6d. per lb.  
(b) 3 yd. 2 ft. 3 in. at 9d. per ft.  
(c) 2 gall. 1 pt. at 1s. per gallon.  
(d) 27 articles at 6d. per dozen.
4. A train, starting at 10.45 a.m., went  $42\frac{1}{2}$  miles by 12.10 p.m. If it runs on at the same speed till 3 p.m. find the total number of miles in its journey.

## B2

1. If 10 sq. yd. cost 5 guineas, how many sq. feet can be bought for 5s. 3d.?
2. A rectangle, 8 in. wide, has an area of 1 sq. ft.; find its perimeter.
3. A glass was  $\frac{2}{3}$  full. I filled it by pouring in  $\frac{3}{4}$  of a pint. How much does the glass hold now?
4. How many tiles, each 3 in. by 2 in. would cover a rectangle 2 yd. by 3 yd.?
5. A boy's home is  $\frac{3}{4}$  mile from his school. Every morning he rides to school. At all other times he walks. He goes home to lunch. How many miles does he walk in 5 days?

## B3

1. A man bought 2 cwt. of potatoes for £3 3s. 2d. He sold 1 cwt. at 7 lb. for 2s. 3d. and the rest at 4 lb. for 1s. 2d. What did he gain?
2. If 8 kilometres equal 5 miles, by how many yards is 1 mile longer than 1 kilometre?
3. A man's garden measures 28 ft. by 40 ft. In the middle he makes a lawn 4 yd. by 10 yd. What fraction of the garden is left?
4. For every half a crown Tom earns Jack earns two shillings. Find their total earnings when Tom has earned one pound more than Jack.

For more Examination Papers, see pp. 54—64.

## FIRST EXAMINATION PAPERS

## B1

1. What change shall I have out of a ten-shilling note after buying  $1\frac{1}{2}$  lb. of margarine at 1s. 2d. per lb.,  $\frac{3}{4}$  lb. of lard at 10d. per lb., 2 bars of candy at  $5\frac{1}{2}$ d. a bar, and 2 lb. of sugar at 9d. per lb.?
2. Mary set out at 10.5 a.m. to visit her aunt and arrived at 10.45 a.m. She left at 11.50 but stopped and talked to a friend and reached home at 12.33 p.m. How long was she talking?
3. Add £2 16s. 3d. to £4 17s. 10d. and take away their difference.
4. A glass bottle contains  $1\frac{3}{4}$  pints. What fraction of the liquid will be left after 1 pt. and  $\frac{1}{4}$  pt. have been taken out?

## B2

1. A train covers the distance between the 36th and the 42nd mile post in 5 min. Express its speed in miles per hour.
2. A wheel measures 8 ft. in circumference, a second 10 ft. and a third 11 ft. How many more turns will the smallest make than the largest in travelling  $1\frac{1}{2}$  miles?
3. It took 8 men 4 days to build a wall. If the number of men were increased by 4, how long would these men take to build a similar wall?
4. When Tom visits Jack he has to go  $\frac{1}{2}$  mile uphill and  $1\frac{1}{4}$  miles downhill. If he cycles at the rate of 3 miles per hour uphill and 12 miles per hour downhill how long will he take to go from Jack's house to his own?

## B3

1. A man drove a car 36 miles on Monday, 48 miles on Wednesday, 27 miles on Friday and 72 miles on Saturday.
  - (a) How many more miles were driven on Monday than on Friday?
  - (b) How many days in the week did he not drive?
  - (c) How many miles did he drive on Wednesday and Saturday together?
2. A boy drew an oblong 10 in. by 6 in. On it he painted a black square with a 2 in. side, and a red oblong 3 in. by 2 in.
  - (a) What area was coloured?
  - (b) What fraction of the drawing was uncoloured?
3. Tom has 3 times as much money as Jack. Jack has 4s. less than Tom. How much have they together?
4. One half of my money is equal to  $\frac{1}{8}$  of Arthur's. If Arthur has two shillings, what is  $\frac{3}{4}$  of my money?

For more Examination Papers, see pp. 54—64.

## B1

1. A man bought 11 books at 6d. each, and some others at 9d. each. He spent 10s. altogether. How many of the second kind did he buy?
2. From £10 take the sum of 3 half-crowns, 10 shillings, 17 sixpences and eighteen pennies.
3. A train runs at 30 miles per hour. It starts at 11 a.m. At 12 noon it stops for 5 minutes; at 1.30 p.m. it stops for 10 minutes. It arrives at 3 p.m.
  - (a) How many miles does it run?
  - (b) If it had run without stopping, when would it have arrived?
4. 1 kilogram equals 2.2 lb. How many kilograms equal 110 lb.?

## B2

1. Find the difference in cost between 35 articles at 1s. 6d. each and 5 articles at half a guinea each.
2. 1 litre equals 1.76 pints. How many litres equal 44 gallons?
3. How many pieces, each  $7\frac{1}{2}$  in. long, can be cut from a length of  $10\frac{1}{2}$  yd., and how many inches will be left over?
4. A shopkeeper buys some balloons for 9s. When he has sold 9 dozen he has received as much as he paid out.
  - (a) At what price did he sell the balloons?
  - (b) If the number of balloons he bought and sold was 144, how much did he gain?

## B3

1. A market gardener made  $\frac{1}{2}$ d. profit out of every 4d. he received. What profit did he make by selling 1 cwt. of tomatoes at 5d. per lb.?
2. A girl had 25 in. of ribbon. She cuts off 7 in. and sews this on to the piece left so as to make a double thickness. What fraction of the piece is now of a single thickness?
3. A man arranged to give  $\frac{3}{4}$  lb. of chocolate to each of 60 children. Ten children were not present. The whole of the chocolate was divided equally among those present. What fraction of a pound did each child receive?
4. A farmer sells  $\frac{5}{8}$  of his store of hay for £12. What is the value of the hay that is left?

For more Examination Papers, see pp. 54—64.

## B1

1. A man walks  $\frac{1}{4}$  mile in 5 min. How many yd. more than 2000 yd. does he walk in 25 min.?
2. Susan, Jane and Mary had 1s., 1s. 9d. and 8d. respectively. Jane spent 10d., Susan 4d. and Mary 3d.
  - (a) How much had Mary?
  - (b) What fraction of Jane's money was left?
3. Three books measure 8 in.  $\times$  6 in.  $\times$  1 in., 8 in.  $\times$  6 in.  $\times$   $\frac{1}{2}$  in., and 8 in.  $\times$  6 in.  $\times$   $\frac{3}{4}$  in. respectively. How much string would be required to tie the three together, if the string passed once round the long way and once round the short way, allowing 6 in. for a knot?
4. When articles cost 6d. each, I can buy 100. How many more can I buy for the same money, if the price of each is reduced by a penny?

## B2

1. Joan sets out for school at 8.35 a.m. and arrives at 8.50 a.m. What is her rate of walking if the distance from home to school is  $\frac{1}{2}$  mile?
2. Lily spent  $\frac{1}{3}$ , Tom  $\frac{1}{4}$  and Mary  $\frac{1}{4}$  of the money in a box. If Jack had the rest, which amounted to half a crown,
  - (a) What did Lily and Tom spend together?
  - (b) What did Tom spend?
3. The area of a picture is one and a half times as great as the area of the mount showing. If the picture measures 14 in.  $\times$  9 in., find the area of the mount.
4. Find the change from 2 guineas after buying  $2\frac{1}{2}$  dozen eggs at  $1\frac{3}{4}$ d. each,  $2\frac{1}{2}$  lb. butter at 1s. 2d. per lb., 14 lemons at 4 for 3d., and 3 lb. of sugar at  $5\frac{1}{2}$ d. per lb.

## B3

1. John saved 6d. the first week, 8d. the second week, 10d. the third week and so on.
  - (a) What did he save in the 7th week?
  - (b) What did he save in the first 5 weeks?
2. Mr. Good sets out from home to catch a train at 9.5 a.m. One day he was 10 min. late and left home at 9 o'clock. How long does he usually take to walk to the station?
3. Tom had 24 marbles, John 36 and Wally 40. If John gave Tom 8, and Tom gave 10 each to John and Wally,
  - (a) How many marbles had Tom?
  - (b) How many more had Wally than John?
4. What fraction of half a guinea have I left after spending  $\frac{3}{4}$  of 7s. 8d.?

For more Examination Papers, see pp. 54—64.

## B1

1. A tram conductor started with 2000 tickets. He sold 960 penny ones, 360 twopenny ones, and 240 threepenny ones.
  - (a) How much money did he take?
  - (b) How many tickets had he left?
2. The weight of water in a tank is 85 lb. A gallon of water weighs 10 lb. How many glasses each holding  $\frac{1}{2}$  pint can be filled from the tank?
3. A man's step measures 27 inches. How many steps will he take in walking 9 miles?
4. A lady has enough money to buy 20 yd. of ribbon at  $6\frac{3}{4}$ d. per yd. Instead, she spends all the money buying cotton at 2s. 6d. per yd. How many yards does she buy?

## B2

1. How many pieces each 27 in. long can be cut from a length of 150 yd?.
2. How many small leaded panes each 2 in. square are there in a window 6 ft. 6 in. high and 3 ft. 4 in. wide?
3. Tom's father gives him 6d. every Friday. How much did Tom receive in December, 1955? (December 2nd was on a Friday.)
4. A girl has 3 pieces of ribbon. The blue one is twice as long as the green one and three times as long as the red one. If the green one is 9 in. long, what length of ribbon has she?

## B3

1. If Jimmy earns 1s. per hour and Bobby 9d. per hour, what will be their total earnings in  $7\frac{1}{2}$  hours?
2. Arthur ate  $\frac{1}{3}$  of a cake and Tom had  $\frac{1}{3}$  of the remainder. What fraction of the cake is left now?
3. A train went 230 miles between 8.50 a.m. and 2.35 p.m. How many miles is this per hour?
4. Mary's father promised her that he would increase her savings by adding to them  $\frac{1}{2}$  of the amount she saved herself. She saves 2s. 6d. per week. In how many weeks would she have 15s.?
5. At a concert, some seats are 8d. each, some are 1s. 2d. each, and the others are 1s. 6d. each. The manager takes £6 6s. 0d. in all. If he sold 60 of the first kind, and 48 of the second, how many of the third kind did he sell?

For more Examination Papers, see pp. 54—64.

## B1

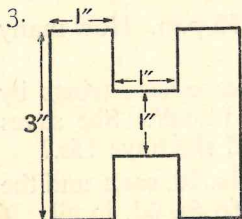
1. Mary has 3s. 6d., Lily has twice as much as Mary, and Elsie half as much as Mary and Lily together. How much have the three children?
2. A piece of paper measuring 8 in. by 6 in. has a square, of  $\frac{1}{2}$  in. side, cut off from each corner. What area remains?
3. 75 toys cost £3 15s. At what price must they be sold per dozen to gain  $\frac{1}{6}$  of their cost?
4. Express the difference between  $\frac{2}{3}$  and  $\frac{3}{8}$  as a fraction of their product.
5. A car travelled 44 yd. in 3 seconds. Express its speed in miles per hour.

## B2

1. Show that the sum of  $\frac{3}{8}$  and  $\frac{3}{4}$  is equal to the difference between  $2\frac{5}{8}$  and  $3\frac{3}{4}$ .
2. A man bought an equal number of cakes at 9d. and 6d. respectively. If he spent £1 how many of the dearer cakes did he buy?
3. Mary had  $\frac{1}{6}$  of the money in a money box, John had 2s. 6d. and Lily had the rest, which amounted to  $\frac{1}{2}$ . How much had Mary?
4. If £5 6s. 8d. buys 24 yd. of cloth, how many more yards can I buy if I spend £5 16s. 0d.?
5. Peter travels from A to B at the rate of  $2\frac{1}{2}$  miles per hour. John, whose speed is one half as quick again as that of Peter, travels the same distance in 45 min. How long does Peter take?

## B3

1. A man bought 60 lb. of apples. He sold a quarter of them at 3d. per lb.,  $\frac{1}{2}$  at 4d. per lb. and the rest at 6d. per lb. How much more than £1 did he receive for the apples?
2. Mary had 5 shillings. She spent 1s. 6d. in one shop and 9d. in another.
  - (a) What change did she receive?
  - (b) What fraction of the money had she left?



How many sq. in. of gold leaf will be required to stamp this initial on each side of a cubical box?

4. A book costs half a crown. How many more can I buy with 5 guineas than with £4?

For more Examination Papers, see pp. 54—64.

# "A" SUMS

*for Advanced Pupils*



*Boys and Girls who can work  
the following sums correctly  
are making good progress*



## MISSING FIGURES

Find the missing figures in the following sums:

## Addition

$$\begin{array}{r} \text{I. } 27 \\ 19 \\ 24 \\ \text{AB} \\ \hline 101 \\ \hline \end{array}$$

$$\begin{array}{r} \text{2. } 3\text{A} \\ \text{B7} \\ 31 \\ 56 \\ \hline 172 \\ \hline \end{array}$$

$$\begin{array}{r} \text{3. } 1\text{A}8 \\ 83 \\ 175 \\ \text{A}26 \\ \hline 832 \\ \hline \end{array}$$

$$\begin{array}{r} \text{4. } 27\text{A}4 \\ 5 \\ \text{B}34 \\ \text{C}09\text{D} \\ \hline 4696 \\ \hline \end{array}$$

## Subtraction

$$\begin{array}{r} \text{5. } 395 \\ \text{ABC} \\ \hline 106 \\ \hline \end{array}$$

$$\begin{array}{r} \text{6. } \text{ABC} \\ 196 \\ \hline 509 \\ \hline \end{array}$$

$$\begin{array}{r} \text{7. } \text{A}8\text{A} \\ 3\text{B}3 \\ \hline 181 \\ \hline \end{array}$$

$$\begin{array}{r} \text{8. } 65\text{A} \\ \text{AB}6 \\ \hline \text{C}97 \\ \hline \end{array}$$

## Multiplication

$$\begin{array}{r} \text{9. } \text{A}3\text{B} \\ 5 \\ \hline 2175 \\ \hline \end{array}$$

$$\begin{array}{r} \text{10. } \text{CBA} \\ 7 \\ \hline 4249 \\ \hline \end{array}$$

$$\begin{array}{r} \text{11. } 131 \\ \text{B} \\ \hline \text{AA}7\text{B} \\ \hline \end{array}$$

$$\begin{array}{r} \text{12. } \text{AAA} \\ \text{A} \\ \hline \text{BC}7\text{A} \\ \hline \end{array}$$

## Division

$$\begin{array}{r} \text{13. } 7 \overline{)2\text{B}4\text{A}} \\ \underline{\text{A}49} \end{array}$$

$$\begin{array}{r} \text{14. } \text{A} \overline{)2\text{B}4\text{A}} \\ \underline{549} \end{array}$$

$$\begin{array}{r} \text{15. } \text{AA} \overline{)2\text{B}2\text{A}} \\ \underline{\text{CAA}} \end{array}$$

$$\begin{array}{r} \text{16. } \text{A}9 \overline{)3\text{BC}} (\text{AE} \\ \text{A}9 \\ \hline 1\text{D}6 \\ \text{A}7\text{A} \\ \hline \text{A}5 \\ \hline \end{array}$$

$$\begin{array}{r} \text{17. } 1\text{A}6 \overline{) \text{B}9\text{A}74} (2\text{D}4 \\ 2\text{E}2 \\ \hline \text{D}8\text{D} \\ 74\text{B} \\ \hline \text{C}5\text{C} \\ 4\text{BC} \\ \hline 30 \\ \hline \end{array}$$

A

B

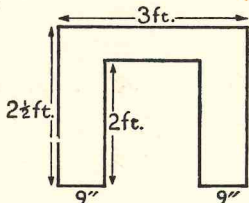
- I. 15 half-crowns  
+ 11 sixpences =
2. £10—£8 4s. 9½d. =
3. £3 14s. 1d. ÷ 7 =
4.  $\frac{1}{8}$  of 15s. =
5.  $\frac{3}{4} - \frac{2}{3}$  =
6. .05 of £1 =
7.  $1.8 \div .03$  =
8.  $25 \times 36$  =
9.  $5\frac{1}{2} \times 1\frac{1}{2}$ d. =
10.  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$  =

1. If 2 lb. cost 2s. 8d. what will  $\frac{1}{2}$  oz. cost?
2. How many square yards in  $\frac{3}{4}$  acre?
3. How many feet in  $\frac{1}{2}$  mile?
4. If  $\frac{2}{7}$  of my money is 21s., what will  $\frac{5}{7}$  be?
5. How many fifths in 9.8?
6. Divide  $1\frac{1}{2}$  ml. by 5 ch.
7. Divide 1s. into two parts, one 1d. more than the other.

PROBLEMS

1. A man takes 6 hours to whitewash 2 ceilings each 9 ft. by  $5\frac{1}{2}$  ft. How many square feet does he do per hour?

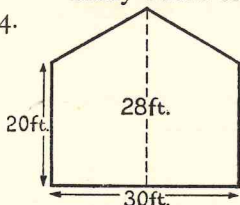
2.



- (a) How many tiles each 6 in. by 2 in. will cover the figure shown in the diagram?
- (b) What will be the total cost at 2d. per tile?

3. A classroom measures 24 ft. by 24 ft. by 20 ft. It is reckoned that 40 boys will use up the air in this classroom in 10 minutes. How many cubic feet does each boy use in 1 minute?

4.



The diagram shows the side wall of a house. A decorator charges £4 10s. to paint this wall.

- (a) What is the area of this wall?
- (b) How many square feet would he paint for £1?

5. A room 24 ft. by 18 ft. has walls 15 ft. high. In the walls are 6 windows, each 4 ft. by 10 ft. What fraction of the wall area is occupied by the windows?
6. How many jars each holding  $\frac{1}{2}$  gallon can be filled from a tank measuring 6 ft. by 4 ft. by 3 ft.? (1 cubic ft. =  $6\frac{1}{4}$  gallons.)
7. A table is 2 ft. 6 in. square. Two leaves can be added, each 9 in wide. Find the total area of the table when the leaves are added.

*Find the cost of*

1.  $4\frac{1}{2}$  yd. at 1s. 11d. per yd.  
 $2\frac{1}{2}$  doz. articles at 4d. each.  
 $1\frac{1}{4}$  yd. at 2s. 11d. per yd.  
 $3\frac{1}{2}$  yd. at 2s. 6d. per yd.
3.  $2\frac{1}{2}$  doz. articles at  $9\frac{3}{4}$ d. each.  
3 gross at 1s. 9d. per doz.  
19 articles at 6s. per gross.  
 $\frac{1}{2}$  gross articles at 1s. 3d. each.
5.  $2\frac{1}{2}$  doz. articles at  $1\frac{1}{2}$ d. each.  
19 articles at  $2\frac{1}{4}$ d. each.  
275 articles at 50 for 3d.  
40 articles at  $9\frac{3}{4}$ d. per doz.
7.  $5\frac{1}{2}$  pt. at 5s. per gall.  
5 qt. at 1s. 1d. per gall.  
 $2\frac{1}{2}$  gall. at  $2\frac{3}{4}$ d. per pint.  
 $\frac{1}{2}$  pint at 2s. 8d. per gall.
9.  $5\frac{1}{2}$  yd. at  $5\frac{1}{2}$ d. per ft.  
 $3\frac{1}{2}$  ft. at 9d. per yd.  
5 yd. 2 ft. at 2s. 3d. per yd.  
9 yd. 2 ft. 3 in. at 1s. 6d. per yd.
11. 65 articles at 1s. 3d. each.  
46     ,,     at 1s. 4d.     ,,  
41     ,,     at 1s. 8d.     ,,  
67     ,,     at 13s. 4d.     ,,

*Find the cost of*

2.  $\frac{1}{2}$  stone at  $2\frac{3}{4}$ d. per lb.  
 $3\frac{1}{2}$  lb. at 1s. 1d. per lb.  
2 score articles at  $\frac{3}{4}$ d. each.  
1000 articles at 6d. for 25.
4. 750 articles at 6d. for 50.  
36 lb. at  $4\frac{1}{2}$ d. per lb.  
30 lb. at  $2\frac{1}{2}$ d. per lb.  
2 gross articles at  $\frac{3}{4}$ d. each.
6. 3 pt. at 2s. per gall.  
2 qt. at  $11\frac{1}{2}$ d. per gall.  
2 gall. 3 qt. at  $\frac{3}{4}$ d. per pt.  
2 gall. 1 qt. 1 pt. at 1s. 4d. per gall.
8.  $8\frac{1}{2}$  lb. at 1s. 3d. per lb.  
 $7\frac{3}{4}$  lb. at 10d. per lb.  
 $9\frac{1}{2}$  stone at  $1\frac{1}{4}$ d. per lb.  
3 lb. 7 oz. at 1s. 4d. per lb.
10.  $2\frac{1}{4}$  ton at 16s. 6d. per ton.  
17 cwt. at 15s. per ton.  
3 qr. 14 lb. at 8s. per cwt.  
15 cwt. at 1s.  $1\frac{1}{2}$ d. per qr.
12. 21 articles at  $11\frac{3}{4}$ d. each.  
18     ,,     at 1s.  $11\frac{1}{2}$ d.     ,,  
32     ,,     at 2s.  $5\frac{1}{2}$ d.     ,,  
16     ,,     at 5s.  $1\frac{1}{2}$ d.     ,,

## A

*What is the average of*

1. £2 10s. 6d., £3 15s. 7d., 10s., and £1 19s.
2. 3 gall. 1 qt., 1 gall. 3 qt. 1 pt., and 5 gall 3 qt.
3. 1 yd. 1 ft. 6 in., 2 ft. 2 in., 1 ft.  $10\frac{1}{2}$  in. and  $9\frac{1}{2}$  in.
4. 2 ton 12 cwt., 3 ton 19 cwt. 3 qr., 15 cwt. 1 qr., and 1 ton 0 cwt. 2 qr.
5. 10, 13, 16, 9, 8, 21, 200.
6.  $3\frac{1}{2}$ ,  $2\frac{1}{12}$ ,  $5\frac{2}{3}$ ,  $1\frac{3}{4}$ .
7. 10.5, 3.61, 15, 9.01, and 3.095.
8. Find the average of 2s. 6d., 1 guinea, 15s., and one florin.
9. Four men are 5 ft. 7 in., 5 ft. 6 in., 5 ft. 9 in., and 6 ft. in height respectively. Find their average height.
10. The following numbers represent the attendances (for a week) of a class of children:—37, 36, 38, 38, 32, 32, 40, 40, 39, 38. What was the average attendance?

## B

1. A man worked the following hours each day:  $8\frac{1}{2}$ ,  $7\frac{1}{4}$ ,  $6\frac{2}{3}$ ,  $8\frac{3}{4}$ ,  $7\frac{1}{2}$ , and 4. Find the average length of his working day.
2. A boy earns on an average £3 16s. 3d. per week. What are his earnings for a year?
3. Joan's average mark in 8 examinations was 34 out of 50. What were her total marks?
4. In a cricket match Jones scored 20 runs, Brown 35, Smith 5, Hughes and Wright 0. What was the average score?
5. The average of 3, 9,  $2\frac{1}{2}$ ,  $1\frac{1}{4}$ , 3, 2, 0, 8 and  $x$  is  $4\frac{1}{12}$ . For what number does  $x$  stand?
6. A cricketer had an average of 38 for five innings. Find his first score if his last four scores were 3, 17, 61, 29.
7. A shopkeeper took £10 2s. 0d. on Monday, 3s. more on Tuesday, nine guineas on Wednesday, and £5 less on Thursday than on Wednesday. He took on an average £12 for Friday and Saturday. What were his average takings for the week?
8. The average of five numbers is 13. The first three are 15, 17, 13. The fourth is the same number as the fifth. What is the fifth number?
9. John's total marks for an examination were 224 out of a total of 350. He gained 40 for Arithmetic, 26 for English, 24 for Science. What was his average mark for History, Geography, Drawing and Literature?
10. The average of 5 numbers is 37. The last two are 18 and 23. Find the average of the first three.

## A

1. A case contained 800 eggs. 5% were unfit for sale. How many were sound?
2. In a school containing 300 children 40% are boys and the rest are girls. How many girls are there?
3. I bought a bicycle for £15 and sold it for £16 10s. Find my gain per cent.
4. On an average a boy saved 5s. 0d. out of a salary of £4. What percentage of his income is this?
5. Increase £8 by  $7\frac{1}{2}\%$ .
6. There are 8 classes in a school and each class consists of 50 children. The following numbers show how many were absent:—3, 5, 0, 6, 0, 7, 4, 3. What percentage of the children were present?
7. Find 120% of  $14\frac{1}{2}$  ton.

## B

1. A dealer bought a piano for £25 and sold it so as to gain  $12\frac{1}{2}\%$ . Find the selling price.
2. In buying and selling a car a dealer makes £25 profit. This profit is  $6\frac{1}{4}\%$  of the cost price. Find (a) the cost price; (b) the selling price.
3. A shopkeeper's profits were £660. This was an increase of 10% upon his profits for the previous year. What were his profits for the previous year?
4. A bookseller allows 5% discount.  
(a) What shall I have to pay for a book marked 7s. 6d.?  
(b) For another book I paid 11s.  $10\frac{1}{2}$ d. What was the marked price of this book?
5. A commercial traveller receives a set wage of £250 a year plus  $1\frac{1}{4}\%$  of the value of the goods he sells. In 1953 he was paid £400. Find the value of the goods he sold.
6. 40% of the candidates at an examination are boys. There are 60 more girls than boys. How many candidates sat for the examination?
7. A grocer bought 1 cwt. of tea. He sold 100 half-lb. packets and 136 quarter-lb. packets. What percentage of the tea was left?

A

1. *Express the following speeds in miles per hour:*
  - (a) 440 yd. in 15 min.
  - (b) 220 yd. in 20 min.
  - (c) 22 yd. in 45 sec.
  - (d) 11 yd. in 25 sec.
2. *Express the following speeds in yards per minute:*
  - (a) 40 miles per hour.
  - (b) 60 miles per hour.
3. *Express the following speeds in miles per hour:*
  - (a) 88 feet per sec.
  - (b) 33 feet per sec.
  - (c) 11 feet per sec.
  - (d) 132 feet per sec.
  - (e) 440 yd. in 1 min.
  - (f) 880 yd. in 5 min.
  - (g) 1 mile in  $7\frac{1}{2}$  min.
  - (h)  $\frac{5}{8}$  mile in  $2\frac{1}{2}$  min.
4. *Express the following speeds in feet per second:*
  - (a) 15 m.p.h.
  - (b) 20 m.p.h.
  - (c)  $7\frac{1}{2}$  m.p.h.
  - (d) 120 m.p.h.
  - (e) 90 m.p.h.
  - (f) 3 miles per min.
  - (g)  $\frac{1}{4}$  mile per min.
  - (h) 45 miles in 40 min.
  - (i) 45 miles in  $1\frac{1}{2}$  hr.
  - (j) 960 miles in 1 day.
5. Between 9.10 a.m. and 12.20 p.m. a train travelled 126 miles. Find its average speed in miles per hour.

B

1. An aeroplane went 315 miles between 11.30 a.m. and 3 p.m. How many feet is this per second?
2. A boy, whose step is 1 ft. 10 ins. long, walks  $2\frac{1}{2}$  miles per hour. How many steps does he take per minute?
3. A train which is 88 yards long takes 6 seconds to pass a signal box. Find the speed of the train in miles per hour.
4. The leader of a procession which is  $\frac{1}{4}$  mile long enters the High Street of a town at 4 p.m. The High Street is  $1\frac{1}{2}$  miles long. The last man in the procession passes out of the High Street at 4.35 p.m. Find the speed of the procession in miles per hour.
5. A man set out at 9.25 a.m. to cycle a distance of 58 miles. He stopped for lunch at 11.30 a.m. and continued his journey at 12.15 p.m. He stopped for tea at 3.15 p.m. and continued his journey at 3.40 p.m. He arrived at his destination at 5.50 p.m. What was his average speed, in miles per hour, for the time he was actually riding?

## MENTAL SUMS

| A                                                       | B                                                                       |
|---------------------------------------------------------|-------------------------------------------------------------------------|
| 1. 15% of 15                                            | 1. Share £1 in the ratio 1:7.                                           |
| 2. $48 \times 5\frac{1}{4}$ d.                          | 2. Divide 1 ton in the ratio 3:2.                                       |
| 3. $\frac{2 \text{ ft. } 9 \text{ in.}}{1 \text{ yd.}}$ | 3. Divide 64 in the ratio $1\frac{1}{2}:2\frac{1}{2}$ .                 |
| 4. .55 of £5                                            | 4. Express in its simplest form the ratio $2\frac{1}{3}:1\frac{1}{4}$ . |
| 5. $(\frac{1}{4} \times .2) \times 8$                   | 5. Divide 10s. in the ratio 1:2:5.                                      |
| 6. $23.6 \times 500$                                    | 6. What decimal fraction is 3d. of 2s.0d.?                              |
| 7. 19s. 11d. $\times 24$                                | 7. A man earns £2 and spends £1 15s. What fraction does he save?        |
| 8. 9s. $11\frac{1}{2}$ d. $\times 48$                   |                                                                         |
| 9. 1 lb. 5 oz. at 3s. per lb.                           |                                                                         |
| 10. $2\frac{3}{4}$ lb. at 1s. 10d. per lb.              |                                                                         |

## A

1. A sum of 4 guineas was shared among A, B, and C. A had twice as much as B, and B had twice as much as C. How much had B?
2. Divide £135 among A, B, and C so that A has 3 times as much as B and B twice as much as C.
3. Divide 30 yards into 3 parts so that the first part is half as much as the second and the second one-third as much as the third.
4. A sum of £14 was shared between John, Jack and Henry. Jack had twice as much as John but half as much as Henry. What was Henry's share?
5. A lady has a glass, a cup and a jug. The jug holds 6 times as much as the glass and 12 times as much as the cup. The three receptacles will hold  $3\frac{3}{4}$  pts. in all. How much can the glass hold?

## B

1. In building a shed Tom worked 4 times as long as Harry and half as long as Jack. What should Tom receive if the total wages come to £2 18s. 6d.?
2. A man bought 3 rectangular fields for £120. One field measured 20 ft. by 15 ft. The other two each measured 30 ft. by 15 ft. Find the cost of the small field.
3. A man started climbing a mountain at 8 a.m. He rested 1 hour on top. He got to the bottom again at 3 p.m. The ascent took 3 times as long as the descent. When did he reach the top?
4. A man shared £1000 between A, B, and C. A and B each received twice as much as C. What did A receive?
5. A jug held 2 qt. of milk and water. There was three times as much milk as water. 1 pt. of water and 1 pt. of milk were added. What fraction of the liquid is water?

A

1. The length of one piece of cardboard is half as great again as the length of another piece, while the breadth is the same. What fraction of the area of the larger piece is the area of the smaller piece?
2. If the length of the edge of a cube is doubled
  - (a) How many times is the volume increased?
  - (b) How many times is the surface area increased?
3. I can buy 300 articles at a certain price. How many more articles could I buy with the same money if the price were reduced by  $\frac{1}{3}$ ?
4. On a charabanc, the fare for a child is equal to one-half the fare for an adult. If the number of children on the charabanc is equal to the number of adults, what fraction of the total fares is paid by the adults?
5. A sold  $\frac{1}{3}$  of his estate to B. B sold  $\frac{1}{2}$  of his share to C. C sold  $\frac{1}{2}$  of his share. What fraction of the estate is still held (1) by A; (2) by C; and (3) what fraction of your first answer is your second answer?
6. A large square is 16 times the area of a small square. What fraction of the perimeter of the large square is the perimeter of the small square?

B

1. A boy draws a square and a rectangle. The length of the rectangle is  $\frac{2}{3}$  times the length of the side of the square. The width of the rectangle is  $\frac{1}{2}$  the length of the rectangle. What fraction of the area of the square is the area of the rectangle?
2.  $\frac{1}{12}$  of a sum of money is 1s. more than  $\frac{1}{15}$  of the same sum. What is the sum of money?
3. One piece of string is  $1\frac{1}{2}$  times the length of another piece. The difference between the two lengths is  $7\frac{1}{2}$  in. Find the total length of the two pieces.
4. Along a straight road, there are 40 large houses on one side and 48 smaller houses on the other. Each large house is  $4\frac{1}{2}$  feet wider than each small house. What is the length of the road?
5. John and Mary share a sum of money so that  $\frac{1}{2}$  of John's share equals  $\frac{1}{5}$  of Mary's. What fraction of the sum of money is John's share?
6. A boy was told to divide a number by  $\frac{2}{3}$ . Instead, he multiplied by  $\frac{2}{3}$ . What fraction of the correct answer was his answer?

| <i>A</i>                                                        | <i>B</i>                                                                                                          |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1. $\cdot 8$ of 1s. 8d. =                                       | 1. Change $\cdot 1$ yd. to inches.                                                                                |
| 2. $\cdot 75d. + \cdot 75s.$ =                                  | 2. $\frac{9}{6} = \frac{3x}{x}$ . Find $x$ .                                                                      |
| 3. $1 - \frac{1}{12} + 4$ =                                     | 3. Find the area of a square with a perimeter of 4.4 in.                                                          |
| 4. $\frac{5}{9} + \frac{1}{12} + \frac{4}{9} + \frac{11}{12}$ = | 4. Tom bought 15 marbles at 5 for 6d.; Jack bought 15 marbles at 3 for 4d. How much did Jack spend more than Tom? |
| 5. Change $\frac{3}{4}$ ml. to yards.                           | 5. 5s. per lb. How much an ounce?                                                                                 |
| 6. $2 \text{ hr.} \div 2\frac{1}{2} \text{ min.}$ =             | 6. Take $\frac{1}{2}$ of $\frac{3}{8}$ away from 1.                                                               |
| 7. $14s. 2d. - 6s. 11\frac{3}{4}d.$ =                           | 7. My money is $1\frac{1}{2}$ times Tom's money. What fraction of my money is Tom's?                              |
| 8. $7s. 6d. \times 36$ =                                        |                                                                                                                   |
| 9. $\frac{1}{2}$ gross at $2\frac{1}{2}d.$ each =               |                                                                                                                   |
| 10. $(1 \div \frac{3}{4}) + (1 \div \frac{3}{8})$ =             |                                                                                                                   |

## DIAGRAMS

(Diagrams will help you to answer these.)

- Two similar squares are placed side by side to form an oblong. The area of each square is 121 square inches. Find the length of the oblong.
- The length of an oblong is 4 times its width. Find the perimeter of the oblong if its area is 64 square inches.
- The length of an oblong is  $1\frac{1}{2}$  times its width. If its area is 150 sq. in., find its length and width.
- The length and width of a rectangle are in the ratio of 5:3. If its area is 60 sq. ft., find its perimeter.
- Tom has  $\frac{2}{3}$  as many marbles as Harry. Harry has 8 more than Tom. How many marbles altogether?
- Alice and Jack shared a sum of money equally. Then Alice gave Jack half of her share. What fraction of the total sum has Jack now?
- A stick is cut into three parts. The first part is twice the length of either of the other parts. What fraction of the total length is the length of each small part?
- Three houses stand side by side. The largest house occupies  $\frac{2}{5}$  of the total length. The other two houses are equal. What fraction of the width of the large house is the width of each small house?
- A manager of a book-shop has a shelf 15 in. long. He has some books 1 in. thick and others  $\frac{3}{4}$  in. thick. He places these books on the shelf alternately, so that a 1-in. book comes at each end.
  - How many books does he put on the shelf?
  - What fraction of the total length is occupied by the 1-in. books?

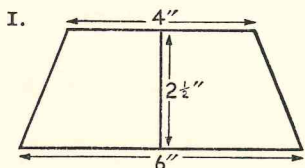
A

1. What fraction of a day passes between 11.5 a.m. and 12.25 p.m.?
2. What is the cost of 12 ton 13 cwt. 1 qr. at £4 per ton?
3. What will 80 gross of books cost at £1 18s. 11d. per doz.?
4. There is sufficient food to last 100 wounded soldiers for 32 days. If 4 men are discharged how much longer will the food last?
5. A courtyard measures 30 ft. by 27 ft. It is to be paved with square blocks each with a  $4\frac{1}{2}$ -in. side. How many will be required?
6. A floor covering 18.25 sq. yd. is to be covered with linoleum. What will be the cost if the linoleum is 27 in. wide at 4s. 6d. per yard?
7. The following table shows a train's speed:  

|                           |                  |
|---------------------------|------------------|
| From 12 noon to 2.30 p.m. | 30 ml. per hour. |
| ,, 2.30 p.m. to 3.30 p.m. | 40 " " "         |
| ,, 3.30 p.m. to 5 p.m.    | 60 " " "         |

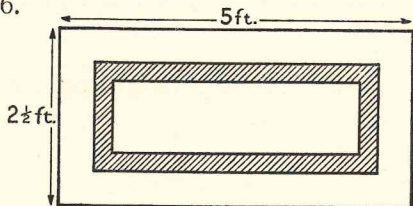
Find its average speed in miles per hour.

B



The uncompleted diagram shows the bottom part of a triangle. If the triangle were completed, what would its perpendicular height be?

2. 60% of the people in a theatre were women. There were 250 men. How many people were in the theatre?
3. A man bought four times as many 1d. stamps as 2d. stamps. If he spent £2,  
 (a) How many stamps did he buy?  
 (b) How many of each kind did he buy?
4. Find the cost of 1000 toys at  $\pounds\frac{8}{125}$  each (using decimals only).
5. The surface area of a cube is 54 sq. in. Find its volume.
- 6.



The white (outside) border shown on the diagram is 6 in. wide; the shaded border is 3 in. wide. What is the area shaded?

A

1.  $\cdot 35$  ton = cwt.
2.  $2\frac{1}{2}\%$  of £3 10s. =
3.  $\cdot 875$  of 5s. =
4. 1 lb. 7 oz. at 3s. per lb.
5.  $1\frac{3}{4}$  yd. at  $\frac{3}{4}$ d. per inch =
6.  $70\cdot 03 \times 8$  =
7.  $3\frac{1}{8} - 2\frac{5}{8}$  =
8.  $2\cdot 525 \div 5$  =
9. 19s.  $10\frac{1}{2}$ d.  $\times 32$  =
10.  $9\cdot 318 \div 300$  =

B

1. If 3 boys can do a job in 4 days, how long will 9 boys take?
2. If the perimeter of a rectangle is 20 in. and the length is 6 in., find the area.
3. How many sq. in. of cardboard will be required to make a cube of 4 in. edge?
4.  $\frac{1}{2}$  of my money equals  $\frac{1}{4}$  of John's money. If John has 6d., how much have I?
5. Find the cost of 1500 articles at 6d. per 25.

## PROBLEMS

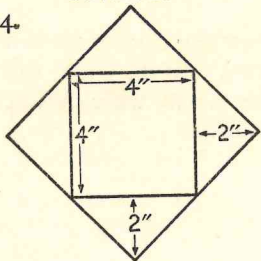
A

1. Add together  $\cdot 35$  of 10s.,  $\cdot 95$  of £4,  $\cdot 7$  of 8s. 4d. and  $\cdot 125$  of a guinea.
2. How long is it from 9.5 a.m. on Monday to 7.25 p.m. on Friday?
3. If I can make 100 nails out of 4 lb. 11 oz. of steel wire, what number should I get from  $3\frac{3}{8}$  lb.?
4. Find the cost of covering a passage 10 yd. long and 6 ft. wide with tiles 9 in. by 8 in. at 5s. per dozen.
5.  $\cdot 125$  of a field was planted with carrots,  $\cdot 5$  of the remainder with cabbages and the rest amounting to  $3\frac{1}{2}$  acres with potatoes. How large was the field?

B

1. A rectangular pond with a surface area of 2400 sq. ft. is 18 ft. deep. When the pond is emptied the water takes 20 hours to run away. How many gallons of water run away each minute?  
(1 cubic ft. water =  $6\frac{1}{4}$  gall.)
2. The average of 10 numbers is 23. The average of the first five numbers is 21. Find the average of the last five numbers.
3. A mount 12 in. by 8 in. has pasted on it a picture which leaves a 1-in. margin on all sides. What decimal fraction of the mount is not covered?

4.



(a) Find the total area of the whole figure.

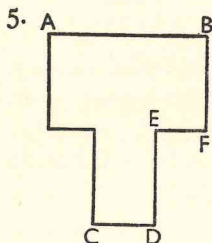
(b) What fraction of the total area is occupied by the inside square?

A

1. A boy saved 6d. every Friday, beginning October 7th, 1955. How much had he saved by Christmas Day in the same year?
2. Mr. Smith and his two sons save together £7 10s. Each son saves  $\frac{3}{4}$  as much as his father. What does Mr. Smith save?
3. A boy's average for 5 innings is 14. How many must he score in his sixth innings if he aims at increasing his average to 15?
4. An athletic club with 234 members wish to employ a groundsman who will be paid at the rate of £9 a week. How much per year must each member contribute towards the groundsman's wages?
5. A bag with a shillingworth of potatoes in it weighs  $20\frac{1}{2}$  lb. The same bag with eightpennyworth of potatoes in it weighs  $14\frac{1}{2}$  lb. How many pounds of potatoes would I get for 2d.?

B

1. Two working parties, A and B, are making a tunnel  $4\frac{3}{4}$  miles long. They are working from opposite ends towards each other. Party A makes 100 yards of tunnel while party B makes 90 yards. How many yards will party A have done when the two parties meet?
2. Two motor cars were racing on a track. When the first car had gone 20 miles, the second car was  $\frac{1}{2}$  mile behind. How many miles ahead was the first car when the second car had gone 20 miles?
3. A commercial traveller's commission was  $2\frac{1}{2}\%$  of the value of goods he sold. He received in 1948 £20 more than he received in 1949. By how much was the value of the goods he sold in 1948 greater than the value of those he sold in 1949?
4. In a workshop, 15 men and 8 women turn out a certain number of boxes in an hour. 8 women do as much work as 5 men. If 16 more women are employed, how long will it take to turn out the same number of boxes?



$BF = ED = 6$  in.

AB and CD are in the ratio of 5:2.

If the total area is 84 sq. in., how long is AB?

## A1

1. Add up £1 9s. 6d., £2 15s. 8d. and £3 4s. 9d.
2. Take 2 gall. 3 qt. 1 pt. from 4 gall.
3. Divide 8 ton 16 cwt. 1 qr. by 3.
4.  $18s. 9d. \times 8$ .
5. Divide £16 by 15.
6. How many  $\frac{1}{2}$ -lb. packets can be made from  $2\frac{1}{2}$  cwt.?
7.  $7\frac{1}{2}$  lb. at  $3\frac{1}{2}d.$  per lb.
8.  $3\frac{3}{4} + 1\frac{5}{8} - 3\frac{1}{2}$ .
9.  $14.01 \times 20$ .
10. Divide 13.5 by .8.
11. What is  $2\frac{1}{2}\%$  of £2 10s. 0d.?
12. What decimal fraction of £3 10s. 0d. is £1 4s. 6d.?
13. A churn was  $\frac{3}{8}$  full. A man filled it by pouring in 35 gall. How many gallons does the churn hold now?
14. A rectangular grass plot measures 6 ft. by 21 ft. A gardener puts a stake at each corner and then other stakes along the sides so that between each stake and the next is a space of 1 yd. How many stakes does he use?

## A2

1. Multiply two thousand and ten by one hundred and nine.
2. Divide 219.09 by 1.09.
3.  $3\frac{2}{3} \times 1\frac{1}{4}$ .
4. Work out  $1.94 + 3.091 - 1.5$ .
5. Express 7 pints as a decimal of 2 gallons.
6. Work out  $3\frac{3}{4}\%$  of 400.
7. If 1 sq. yd. 2 sq. ft. cost 2s. 9d. how many square yards shall I get for 45s.?
8. Find the cost of:—
  - (a)  $2\frac{1}{2}$  gross at  $1\frac{1}{2}d.$  each.
  - (b) 3 cwt. 1 qr. at £2 per ton.
  - (c) 5 yd. 2 ft. 3 in. at 9d. per yd.
  - (d) 2 acres 3 roods at £15 per acre.
9. A chapter in a book consists of 30 pages. There are 45 lines to each page and 12 words in each line. A girl reads this chapter in 40 min. How many words does she read per minute?
10. A man starts on a journey at 8.30 a.m. At 12 noon he still has  $1\frac{1}{8}$  miles to go. He finishes the journey at 12.30 p.m.
  - (a) Find his speed in miles per hour.
  - (b) How many miles did he walk?

A1

1. Find  $\frac{1}{24}$  of £26 8s. 4d.
2. (a)  $5\frac{5}{8} + 6\frac{3}{4} + 7\frac{5}{6}$ .  
(b)  $7\frac{5}{33} - 5\frac{5}{22}$ .
3. How much is 1963 yd. short of  $2\frac{1}{2}$  ml.?
4. What fraction of £2 6s. 8d. have I left after I have spent 10s. 0d.?
5. Find the value of 2 yd. 2 ft. 7 in. of timber at 12s. per ft.
6. A grocer's balance was wrong and indicated that 1 lb. weighed only .875 lb. What would be the correct weight of a parcel shown to weigh 21 lb.?
7. Complete the following table:

| (a) Fraction  | (b) Decimal | (c) Percentage |
|---------------|-------------|----------------|
| $\frac{1}{2}$ | =           | =              |
| =             | .8          | =              |
| =             | =           | 33%            |

A2

1. 6s. 8d.  $\times$  123.
2. £2 6s. 4d. + £3 17s.  $2\frac{1}{2}$ d. + £4 9s. 0d.
3. Find  $\frac{3}{4}$  of half a crown.
4. .875 of a ton (*answer in lb.*)
5.  $0.36 + 0.1 + .0001$ .
6.  $0.37 \times .027$ .
7. 1000 nutmegs at 1d. each.
8. Express  $\frac{19}{40}$  as a decimal fraction.
9. What fraction is 1s. 4d. of 16s.?
10. Find the area of a floor  $6\frac{1}{2}$  yd. long and 72 in. wide.
11. If  $6\frac{1}{2}$ d. buys 10 yd. what would 6.5 shillings buy?
12. Find the cost of 125 toys at £10 per 1000.
13. What must be added to  $\frac{3}{4}$  to make it three times as big?
14.  $12\frac{1}{2}\%$  of 3 yd. 12 in.
15. 13 lb. of potatoes at  $3\frac{1}{2}$ d. per lb.
16. A boy spends 8s. 4d. on  $1\frac{1}{2}$ d. and 1d. stamps. If he buys an equal number of each how many 1d. stamps does he buy?
17. 12 cwt. at £2 15s. 0d. a ton.
18. Express the speed of 100 yd. in 30 sec. in miles per hour.
19. If 1 man or 3 boys can do a job in 9 days, how long will it take 3 men and 9 boys?
20. 15% of £3 2s. 6d.

## A1

1. Divide 2507 by 23.
2. What simple fractions are equal to
  - (a)  $\frac{1 \text{ ton } 16 \text{ cwt.}}{6 \text{ ton.}}$
  - (b)  $\frac{2\text{s. } 7\frac{1}{2}\text{d.}}{3\text{s.}}$
  - (c)  $\frac{2 \text{ yd. } 1 \text{ ft. } 6 \text{ in.}}{6 \text{ yd. } 2 \text{ ft.}}$
3. What is the total area of all 6 sides of a cube with a  $7\frac{1}{2}$  in. edge?
4. Work out:—
  - (a)  $3\frac{1}{4} + 4.75 - 1\frac{3}{100}$ .
  - (b)  $.325$  of 10d.
  - (c)  $(3\frac{1}{2} \times 3\frac{1}{3}) \div 12.5$ .
5. Find the values of:—
  - (a) 1 ton 5 cwt. 1 qr. at 1s. 6d. per qr.
  - (b) 2 sq. yd. 4 sq. ft. at 4s. 6d. per sq. yd.
  - (c) 20 gross of toys at 1s. for 10.
  - (d) 17 gall. 2 qt. at 7d. per gallon.
6. If I walk 5 miles between 12.45 p.m. and 2.25 p.m. how many hours will it take me to walk 6 miles?

## A2

1.  $37 \times 19$ .
  2.  $4\frac{1}{2} \div 3\frac{2}{5}$ .
  3. Multiply  $.25$  by  $.25$ .
  4. Find 1.85 times 8s. 4d.
  5. What is the remainder when £40 has been divided by 23?
  6. Take 17 half-crowns from  $4\frac{1}{2}$  guineas.
- Work out the cost of:—
7. 15 cwt. at £2 10s. per ton.
  8. 2500 boxes at 12s. a hundred.
  9. 2 lb. 4 oz. at 3s. per lb.
  10.  $2\frac{1}{2}$  yd. at  $5\frac{1}{2}$ d. per foot.
  11. 36 yards at  $5\frac{3}{4}$ d. per yard.
  12. 2 pt. at 4s. 6d. per gallon.
  13. What fraction of 5 acres is 2 acres 3 roods?
  14. Divide  $2\frac{1}{2}$  sq. ft. by 5 sq. in.
  15. How many minutes elapse between 1.15 a.m. and 12 midnight?
  16. If I spend  $\frac{3}{8}$  of 16s. 8d. how much is left?
  17.  $1.75$  gallons +  $1.75$  quarts.
  18. Work out 25% of 5s. 4d.
  19. If I walk 3 furlongs in 6 min., how long shall I take to walk 1 mile?
  20. If I ride 3 furlongs in 1 minute, how many miles shall I ride in 1 hour?

A1

1. £24 3s.  $8\frac{1}{4}$ d.  $\times 24$ .
2.  $9\cdot64 \times 4\cdot5$  (answer to the nearest whole number.)
3. Find  $7\frac{1}{2}\%$  of 20 guineas.
4. Express as fractions:—  
 (a)  $\frac{4\text{s. } 6\text{d.}}{6\text{s. } 0\text{d.}}$                       (b)  $\frac{2\text{ lb. } 6\text{ oz.}}{4\text{ lb. } 8\text{ oz.}}$                       (c)  $\frac{1\text{ ton } 15\text{ cwt.}}{2\text{ ton.}}$
5. How many miles an hour is equal to 14 yd. in 6 sec.?
6. (a)  $2\frac{7}{12} + 3\frac{1}{8} + 2\frac{1}{3}$ .                      (b)  $15\frac{3}{4} \times \frac{8}{9} \times 4$ .
7. If  $2\frac{7}{8}$  lb. of wool can be knitted into 5 jumpers, how many jumpers can be made from  $8\frac{3}{8}$  lb. of wool?

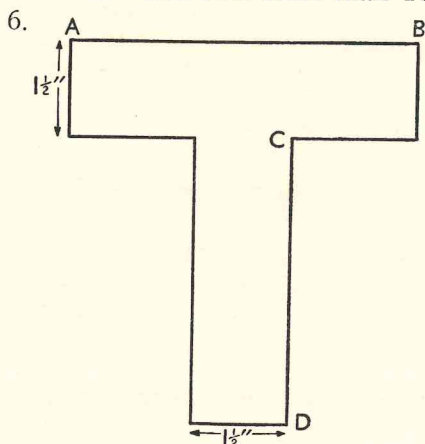
A2

1.  $\frac{1}{209}$  of 43681.
2. Take the least from the greatest of the following:—  
 $5\frac{7}{9}$ ,  $5\frac{3}{4}$ ,  $2\frac{1}{15}$  and  $2\frac{2}{3}$ .
3. (a)  $3\frac{3}{5} \times 7\frac{1}{7} \times 3\frac{1}{9}$ .                      (b)  $(5\frac{4}{9} \div 5\frac{3}{5}) \times 2\frac{2}{5}$ .
4. Fill in the missing figures:  

| Fraction       | Decimal | Percentage         |
|----------------|---------|--------------------|
| $\frac{1}{2}$  | =       | =                  |
| =              | ·36     | =                  |
| =              | =       | 12 $\frac{1}{2}\%$ |
| $\frac{1}{25}$ | =       | =                  |
5.  $6\cdot04 + 0\cdot63 - 20 + 26\cdot006$ .
6. ·72 metres of gabardine are worth 2·4 francs. Find the value of 3·6 metres.

## B

1. In a theatre there are 180 seats at 10s. 6d. each, 120 at 3s. each, and 200 at 1s. 8d. each. How much money is taken if every seat is sold during a week in which there are 8 performances?
2. A house with 20 acres of land was valued at £1810. A similar house with 35 acres of land was valued at £1855. Find the value of
  - (a) the house
  - (b) each acre of land.
3. An oil merchant has two tanks. The smaller one is  $\frac{3}{4}$  of the size of the other one. Both tanks were half full. The merchant let all the oil in the smaller tank run into the large tank. What fraction of the large tank is now occupied by oil?
4. A commercial traveller received a salary of £200 per year. In addition, he was paid 1% of the value of the goods he sold, plus an extra  $\frac{1}{2}$ % of the value of any goods he sold beyond £30,000 worth per year.
  - (a) In 1949, his sales amounted to £25,000. Find his salary for that year.
  - (b) In 1948, he received £560. What were his sales for that year?
  - (c) In 1947, his sales amounted to £32,000. Find his salary for that year.
5. A sum of money was shared among Jack, Tom, and Harry, so that Tom had  $\frac{2}{3}$  as much as Jack, and Harry had half as much as Tom. Jack had 10d. more than Tom. How much had Harry?



The area of the figure shown in the diagram is 15 sq. in.  
The length of AB is to the length of CD as 11 is to 9.

Find the length of

- (a) AB
- (b) CD
- (c) the total perimeter of the whole figure.

## B

1. In a factory are 24 men who are each paid £7 10s. per week, a foreman who receives £10 10s. per week, a clerk at £11 10s. per week, and a manager at £800 per year. Find the total wages paid in 6 months (26 weeks).
2. Two plots of land were sold together for £380. The smaller plot is worth  $\frac{2}{3}$  as much as the larger plot. Find the value of each plot.
3. A vessel with 8 pints of liquid in it weighed  $12\frac{1}{2}$  lb. The same vessel with 12 pints of liquid weighed  $17\frac{1}{2}$  lb. Find the weight of the vessel.
4. 1 metre=39.37 inches. 1 franc=2d.
  - (a) If silk is 5s. per yard, how many francs would I have to pay for 1 metre? Give your answer to the nearest franc.
  - (b) If calico is 4 francs per metre, find, in English money, the price of 1 yard. Give your answer to the nearest farthing.
5. Complete the last column in the following table. (*Give your answer to the nearest whole number.*)

| Goods         | Number of factories | Number of men | Average number of men in each factory |
|---------------|---------------------|---------------|---------------------------------------|
| Biscuits      | 145                 | 5583          |                                       |
| Confectionery | 267                 | 8849          |                                       |
| Jams          | 165                 | 6189          |                                       |

6. Mr. A. was engaged on January 1st, 1910, on the following terms:—£160 for the first year, £170 for the second, £180 for the third, and so on until he reached £300 per year, after which his salary remained stationary.
  - (a) What was the first year in which he was paid £300?
  - (b) Find his average salary for the first 15 years.
  - (c) What will his average salary be (for the whole period) if he works for 25 years?
7. Three men, Smith, Jones and Brown, put some money together in order to purchase an estate. Later the estate was sold, and the proceeds were divided as follows:—Smith, £620; Jones, £930; Brown £1240.

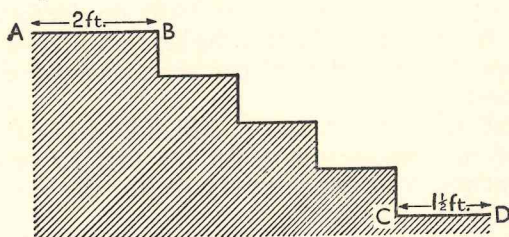
Complete the following statement:—

In the first place, Brown contributed £1 while Jones contributed ... and Smith contributed ....

## B

1. Work out  $\frac{1.8 \times 3.5}{.28 \times 3.6}$
2. At a sports meeting, there were 17 races. The total prize-money amounted to £22 6s. 3d., and this was equally divided among the 17 races. There were three prizes for each race. In each race, the first boy received twice as much as the second boy and four times as much as the third boy.  
Jack ran in 2 races and won prizes worth 11s. 3d. in all.  
(a) In how many races did he win a prize?  
(b) In how many races did he come first?
3. A woman has a jug which is half full of milk and a glass which is a quarter full of milk. The jug can hold 5 times as much as the glass. She fills up the glass from the jug. What fraction of the volume of the jug is now occupied by the milk left in it?
4. A book is printed so that there are 38 lines on each page and 11 words in each line. Each chapter starts a fresh page. The first chapter has 8400 words, the second 9326 words, the third 5421 words. On what page will the 20000th word come?
5. A swimming bath is 80 ft. long. The shallow end is 3 ft. deep, the deep end is 7 ft. deep. The bottom slopes regularly.  
(a) How deep is it 20 ft. from the shallow end?  
(b) A boy swims from the deep end to the place where the bath is 5 ft. deep. How far does he swim?

6.



The diagram shows a flight of steps. Each step is 9 in. high and 15 in. deep.

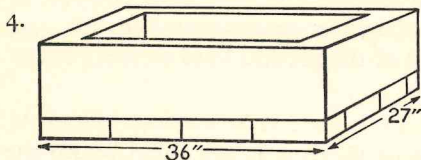
- (a) By how many feet is A higher than D?
- (b) What length of carpet would be required to reach from D to A?
- (c) If this carpet is 22 in. wide and costs £1 17s. 7d. find the price of each square foot.

B1

1. What would be the value of a roll of cloth 36 in. wide and 54 yd. long if 12 sq. yd. cost 27s.?
2. Prices for admission to a football match are 4d., 6d. and 8d. £2 16s. 8d. is taken in fourpences, £5 10s. 0d. in sixpences and £8 14s. 8d. in eightpences. How many turns do the turnstiles make if each one admits four people during each complete turn?
3. The trains from a certain station to London run at 8.11 a.m., 8.29 a.m. and 8.40 a.m. A man has 6 min. walk to the station and the train journey takes 21 min. At what time must he leave home to reach the office by 9 a.m.?
4. John had a square piece of paper, on which he drew a square which measured one quarter of the area of the paper. He painted a quarter of this square black, half green, and a quarter yellow. What fraction of the paper was painted yellow?
5. Jack had a number of marbles of which  $\frac{1}{4}$  were red and  $\frac{3}{4}$  blue. He gave a third of his marbles to Fred who had none. If one half of Fred's marbles were blue and one half red, what fraction of the marbles which Jack now has are red?

B2

1. A motorist travelling at the rate of  $22\frac{1}{2}$  ml. an hr. passes a cyclist at a point A which is  $7\frac{1}{2}$  ml. from station B. If the cyclist covers the distance from A to B in 45 min.
  - (a) At what rate is he travelling?
  - (b) How long will it take the motorist to cover the distance from A to B?
2. At a party it was found there were enough cakes left for half the children to have another half a cake each. If the number of cakes left was  $\frac{1}{9}$  of the total, how many cakes would each child have eaten supposing the cakes had been shared equally?
3. If 1 litre =  $1\frac{3}{4}$  pt. and 1 franc = 2d. Express:—
  - (a) One shilling for  $1\frac{3}{4}$  gall. in francs per litre.
  - (b) 28 francs for 12 litres in pence per pint.



How many bricks each 9 in.  $\times$  3 in.  $\times$   $4\frac{1}{2}$  in. will be required to build the walls of the receptacle shown in the diagram? The walls are  $4\frac{1}{2}$  in. thick and 12 in. high.

(The bottom layer of bricks is drawn for you.)

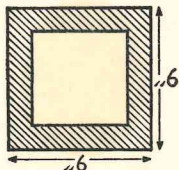
## B

1. A dealer has 8560 balloons. He sells the first thousand at 10 for 1s., the second thousand at 1d. each, the third thousand at 9d. per dozen, and the fourth thousand at 10 for 6d. The rest he sells at  $\frac{1}{2}$ d. each.

Find his total takings.

2. A builder set 10 men to build a wall. They built one-third of it in 3 days. How many more men must he set on the job so that the wall may be finished in another 2 days?
3. (a) If 1 inch equals 2.54 centimetres, how many inches equal 1 metre? (1 metre = 100 cm.)
- (b) Use the following figures to find the weight in pounds of 1 gallon of water.  
 1 litre =  $1\frac{3}{4}$  pt. 1 kilogram =  $2\frac{1}{5}$  lb.  
 1 litre of water weighs 1 kilogram.

4.



The area shaded is equal to  $1\frac{1}{4}$  times the area of the small square. If the side of the large square measures 9 in. how long is the side of the small square?

5. Complete the following sum

$$\begin{array}{r} \text{A13)B9C40(E18} \\ \text{B52} \\ \hline \end{array}$$

$$\text{D9E}$$

$$\text{2C3}$$

$$\text{1B1F}$$

$$\text{C7FE}$$

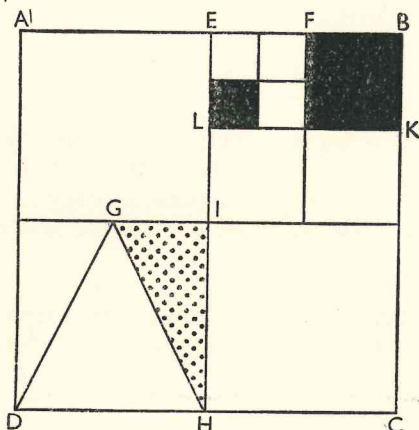
$$\text{106}$$

6. A box containing wooden bricks is a cube with an edge measuring 1 foot. There are two kinds of bricks; the first kind consists of 1 inch cubes, the second kind of bricks measuring 2 in. by 2 in. by 1 in. There are twice as many of the second kind as there are of the first kind.
- (a) How many bricks are there?
- (b) What fraction of the volume of the box is occupied by all the bricks of the second kind?

*B*

1. A jar of oil held  $\frac{2}{3}$  of a quart.  $\frac{5}{6}$  of a quart was added. What fraction of the jar was full if its total capacity was  $3\frac{1}{2}$  quarts?
2. A man bought 3d., 6d. and 9d. toys for a Christmas Party. He bought an equal number of 3d. and 6d. toys and twice as many 9d. toys as 3d. toys. If he spent altogether £5 8s.
  - (a) How many 6d. toys did he buy?
  - (b) What fraction of his money was spent on the 9d. toys?
3. A sum of money was shared equally among 4 boys. Half that sum was shared equally among 4 girls.
  - (a) By what fraction of the total money was one boy's share greater than one girl's share?
  - (b) If 2s. had to be taken from every boy and given to every girl to make the shares equal, what did each boy receive at first?

4.



ABCD is a square

AE = EB

EF = FB

DG = GH



- (a) How many of the smallest squares are contained in the square ABCD?
  - (b) What fraction of the figure is painted green?
  - (c) What fraction of the figure is painted black?
  - (d) What fraction of the figure EBKL is the figure GIH?
5. The top of a ladder 20 ft. long rests against the top of a wall which is 15 ft. high. A man descends 5 ft. down the ladder. How many feet is he now above the ground?

## B

1. Malton Road is two and a half times as long as Witton Street. Witton Street is 99 yards shorter than Malton Road. How long is Witton Street?
2. A motorist starts on a journey at 10 a.m. By 2.30 p.m. he has gone 108 miles. After this, he goes at 30 miles per hour until 5.10 p.m. He continues until 8.30 p.m. He has then gone 228 miles in all. Work out:—
  - (a) His average speed (in miles per hour) for the first period.
  - (b) The number of miles he went in the second period.
  - (c) His average speed in miles per hour for the whole journey.
3. A vase 8 inches high stands on a base 4 inches wide. The top of the vase is 8 inches wide and the sides of the vase slope regularly. How wide is the vase
  - (a) 4 inches above the base?
  - (b) 6    "       "       "       "   ?
  - (c) 3 inches below the top?
4. Out of a piece of paper which is yellow on the front and white on the back a girl cuts a triangle having all its sides equal. She then folds the triangle so that the apex touches the middle point of the base. What fraction of the area of the triangle is the area of the white piece now showing?
5. A newsagent sells 30 fourpenny papers each Sunday and 72 twopenny papers each week-day. How much money did he take during January, if January 1st came on a Sunday?
6. Complete the following multiplication sum

$$\begin{array}{r}
 3 - 6 - \\
 7 - 1 \\
 \hline
 - 2 - 5 - 0 \ 0 \\
 2 - 1 - 0 \ 0 \\
 - 2 - 5 \\
 \hline
 2 - 4 - 9 \ 6 \ 5 \\
 \hline
 \hline
 \end{array}$$

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**B & A**  
**ARITHMETIC**  
**BOOK 4**

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